

DISCLOSING INDOOR ENVIRONMENTAL QUALITY TO CREATE VALUE IN THE RESIDENTIAL REAL ESTATE MARKET

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ABSTRACT

There is a consensus among experts that consumers do not regard Indoor Environmental Quality (IEQ) attributes of dwellings as relevant when purchasing homes. Namely, they are not willing to pay more for naturally illuminated, warm, quiet, or easy to ventilate properties. However, other evidence suggests that consumers value IEQ when choosing the location of their new home. Based on 18 interviews with consumers from Chile and New Zealand, this paper argues that consumers do value IEQ attributes and, in fact, intend to purchase dwellings of a high IEQ. However, consumers are incapable of doing so because IEQ attributes are not often assessable during the home-searching process. Further, our research suggests that consumers do not trust the IEQ claims made by agents, developers and sellers. It is therefore suggested that proper communication of IEQ attributes might give consumers the ability to make informed choices about high-IEQ dwellings, thereby creating value and improving the housing stock.

Keywords: customer value, comfort, indoor environmental quality, residential real estate

INTRODUCTION

Dwellings are not only financial assets and objects of social expression and symbolic meaning but also functional objects (Rodriguez and Siret, 2009; Blanchett, 2017). As a functional object, one of the main objectives of a dwelling is to offer an acceptable *Indoor Environmental Quality* (IEQ). In other words, to provide its occupants with a comfortable and healthy environment with an appropriate temperature, humidity, daylight and quietness, among other things. Nonetheless, research suggests that IEQ attributes, such as the quality of daylight, thermal comfort, quietness and others, are often assumed irrelevant to consumers. For instance, the list of recommended characteristics to include in Hedonic Regression models — one of the most common methods for modelling the price of real estate assets based on market data (Aroul, 2009; Sopranzetti, 2010; Adetiloye and Eke, 2014) — does not include IEQ attributes. On the contrary, the recommendation is to consider structural properties, neighbourhood characteristics, location, exterior environmental quality, contract conditions, and other potentially relevant aspects such as the view to cemeteries, *Fengshui* and “lucky” or “unlucky” address numbers (Chin and Chau, 2003; Sopranzetti, 2010; Chia *et al.*, 2016; Xiao, 2017). These same characteristics are also recognized to be some of the most influential factors on the residential property prices by appraisers (Ferlan, Bastic and Psunder, 2017).

However, IEQ attributes have not been proved irrelevant in the determination of dwellings’ prices. On the contrary, the support for such an assumption probably arises from the fact that several pricing models in the real estate literature have a high predicting power, even if they do not consider such attributes (e.g. Addae-Dapaah & Chieh, 2011; Bloom *et al.*, 2011; Hyland *et al.*, 2013; Soriano, 2008). This suggests that IEQ attributes have a low impact on a dwelling’s price.

Regardless of the reasons to believe that consumers do not consider IEQ attributes in their purchase decisions, vast evidence suggests that consumers do consider environmental quality when selecting between different locations for their homes. For instance, dwellings in places with traffic or environmental noise are often sold for less money than those located in quiet neighbourhoods (Nelson, 1982; Huang and Palmquist, 2001; Cushing-Daniels and Murray, 2005; Jim and Chen, 2006; Julien and Lanoie, 2007; Brandt and Maennig, 2011; Allen, Austin and Mushfiq, 2015; Szczepańska, Senetra and Wasilewicz-Pszczółkowska, 2015; Swoboda,

Nega and Timm, 2015; Del Giudice *et al.*, 2017; Ferlan, Bastic and Psunder, 2017). Likewise, consumers appear to be willing to pay less for dwellings exposed to airport noise (He *et al.*, 2014; Lavandier *et al.*, 2016) or other sources of disruptive sounds (Beimer and Maennig, 2017). And, in a similar manner, dwellings exposed to air pollution (Nourse, 1967; Ridker and Henning, 1967; Komarova, 2009; Zheng *et al.*, 2014; Chen and Chen, 2017; Le Boennec and Salladarré, 2017), soil contamination and industrial residues (Jenkins-Smith *et al.*, 2002; Decker, Nielsen and Sindt, 2005; Simons and Saginor, 2006; Horváth and Hajnal, 2014; Torre, Balena and Ceppi, 2014) are known to be sold with a penalty in their price.

Thus, the literature presents a contradiction: while consumers seem to be willing to pay more for dwellings that are located in neighbourhoods with high environmental quality, they simultaneously disregard IEQ attributes of dwellings when making purchase decisions. Why would consumers value environmental quality when selecting a neighbourhood only to disregard it when choosing a specific dwelling? This is the research question of this study.

By means of a set of semi-structured interviews, this study suggests that the origin of said contradiction is not related to value, but to the amount of information that consumers have in hand during their home searching process, and to its trustworthiness. Namely, this article suggests that consumers do value the IEQ attributes of warmth and natural light. However, they can only discriminate between high- and low-IEQ dwellings at the scale of the neighbourhood and not at a per-home scale. For instance, they can identify a sunny neighbourhood by observing obstructions and orientation of the street, but they are incapable of identifying which of the dwellings in such a neighbourhood or street is the warmest one. Thus, helping consumers to make purchase decisions based on their IEQ would allow architects, developers and construction companies to use IEQ attributes to create value, differentiate themselves from their competition, and more. However, this implies overcoming the high scepticism towards unverifiable claims that the respondents expressed.

The rest of this article is structured as follows. First, a literature review is presented with the purpose of explaining the rationale behind the questions in the interview. Then, the results from a set of interviews are presented along with a discussion on the possibilities of creating value through the communication of IEQ attributes. This article finishes by presenting conclusions and propositions for future research.

LITERATURE REVIEW

This research is grounded on the Economics of Information theory, a branch of economics which, among other things, understand that consumers are not passive receivers of information. On the contrary, it sees *the search* for information as a costly activity (Stiglitz and Walsh, 2006, p. 344). Furthermore, it acknowledges that it is easier to acquire information about certain attributes than others. For instance, it is easier to assess the aesthetic quality of a dwelling than to verify its structural integrity. While the former is observable in pictures or during a visit, the latter qualities require a much more thorough analysis. This allows classifying products attributes into three main categories: *Search*, *Experience* and *Credence* (Nelson, 1970, 1974; Darby and Karni, 1973).

Search attributes are those easily assessable before purchasing a certain product. For example, the size, aesthetic, and spatial configuration of a dwelling. *Experience* attributes, on their part, are those difficult to evaluate before purchasing the good. For instance, it is not possible to know how warm and quiet a dwelling is in pictures, but it is easily noticeable by living in it. Finally, *credence* attributes are very hard to assess even after purchasing the good. For instance, it will be difficult to assess the carbon footprint of a house, even while living in it. Dwellings have often been classified as *experience goods* because several of their key attributes cannot be assessed before purchase (Chau, Wong and Yiu, 2007; He and Wu, 2016; Zhang, Wu and Liu, 2018). However, no literature seem to have analysed IEQ attributes from this framework.

IEQ attributes of dwellings, such as the quality of daylight, thermal comfort, ventilation, air quality and humidity, can be said to be *experience* attributes because assessing them usually requires living in the dwelling. Assessing these attributes beforehand might be possible, but expensive or impractical. For instance, modern daylight performance metrics (Nabil and Mardaljevic, 2005; IESNA, 2012; Dogan and Park, 2017) rely on dynamic simulations to be reasonably realistic (Reinhart, Mardaljevic and Rogers, 2006). “Rules-of-thumb” that are applicable during a visit, on their part, have severe limitations related to the shape and materiality of the space, even in the accuracy of the results (Reinhart and LoVerso, 2010). This means that even if a consumer looking for a “naturally illuminated” dwelling can search for those with “big windows”, it is difficult to assure a satisfactory result. Even worse, since the thermal, lighting, ventilation and acoustics domains of building physics are all related (Citherlet, Clarke and Hand, 2001), associating consequences with features becomes even more complicated. For instance, “big windows” can also lead to space overheating due to an excess of

solar radiation (Kuhn and Platzer, 2001; Tzempelikos and Athienitis, 2007; Molina, 2014). In summary, IEQ attributes are *experience* and even *credence* attributes.

Since consumers are unable to assess IEQ attributes during their search for a new home, they must be informed about them. Nonetheless, that information might be subject to high scepticism because consumers know that sellers would use such claims for persuading them to buy certain properties, thus having an incentive to exaggerate (Ford, Smith and Swasy, 1988; Obermiller and Spangenberg, 1998). Unable to verify such claims, consumers are expected to be more sceptical about them than of those they can easily verify (Ford, Smith and Swasy, 1988, 1990; Feick and Gierl, 1996; Obermiller and Spangenberg, 1998, 2000). In fact, a higher consumer scepticism appears to be correlated with a higher tendency to seek the verification of claims (Obermiller, Spangenberg and MacLachlan, 2005).

Dealing with consumers' scepticism becomes possible when acknowledging that it is not strictly necessary that consumers themselves are the ones that verify the provided information. On the contrary, experts and third party entities can systematically verify and communicate IEQ attributes. This is known as *quality disclosure* (Grossman and Hart, 1980; Grossman, 1981; Dranove and Jin, 2010). Probably the most mature and successful example of *quality disclosure* in the housing market is the use of so-called 'green labels', such as Energy Performance Certificates, and building rating tools like BREAAAM or LEED (FrondeL, Gerster and Vance, 2017; Fesselmeyer, 2018). These labels are obtained by asking a third-party to certify how sustainable a building is and are supposed to add value and increase the dwelling's desirability (IEA, 2010). Several studies have shown that this mechanism effectively increases the price of certified properties (e.g. Soriano, 2008; Addae-Dapaah and Chieh, 2011; Bloom, Nobe and Nobe, 2011; Brounen and Kok, 2011) at least in certain market segments (Molina *et al.*, 2019). To use them as an example, green labels *disclose* the "sustainability" of the building.

Consequently, a plausible reason why consumers value environmental quality when selecting a neighbourhood only to disregard them when choosing a specific dwelling is that: (1) consumers do value the IEQ attributes, but (2) they can only discriminate between high- and low-IEQ dwellings at the scale of the neighbourhood and not at a per-home scale. Thus, the only option for consumers to consider IEQ attributes in their purchase decisions is that they are given such information. However (3) consumers are sceptical of IEQ-related claims made by vendors. Thus (4) asking third-parties to certify the IEQ-related information provided to consumers can reduce their scepticism.

METHOD

As mentioned earlier, the research question of this paper is why would consumers value environmental quality when selecting a neighbourhood only to disregard it when choosing a specific dwelling? An answer to such question was proposed earlier, arguing that it is possible that consumers do value IEQ attributes, but that they cannot assess them, and do not trust the information they receive about it. Thus, this method intends to answer (1) whether people value IEQ attributes and (2) whether they trust the information about IEQ attributes they receive during their search for homes. Nonetheless, question 1 has been divided into two questions, related to the IEQ attributes of Daylight and Warmth. This separation was made because it is not necessarily true that all IEQ attributes are equally valued by consumers, thus asking them separately is deemed more appropriate.

While the mentioned questions could be written in mathematical terms and statistically tested as hypotheses, this research intends to respond the question by means of semi-structured interviews. This responds to the fact that interviews allow gathering richer information. For instance, while questionnaires allow understanding *whether* people value IEQ attributes, interviews allow gathering data about *why* do they value them. This data—which cannot be gathered through questionnaires—can help to develop much richer questionnaires and hypotheses for future research.

Sampling

The target population in this exercise was people who comply with two requirements. First, to have recently gone through, or that were at that time going through, a home-searching process with the purpose of purchasing and living in it themselves (i.e. excluding investors and people who design their new home). And second, to have performed such a search either in Wellington, New Zealand or in Santiago, Chile.

The rationale behind the first criteria is that people who have recently searched, or are currently searching, for a new home are supposed to have a relatively fresh memory of their own expectations and experiences about dwellings of high IEQ, thus helping to reach saturation earlier. These locations, on their part, were chosen

because they are significantly different from each other and yet they are easy to reach by the researcher—who is Chilean but is currently living in Wellington. Examples of differences between Wellington and Santiago are the population, density, per capita income, climate, culture, among others. The existence of these differences ensures that the results are not constrained to a single country or culture.

The total sample consisted of 10 men and 8 women who had already finished their home-searching process. From all the 18 respondents, nine performed their search in Wellington while the other nine did it in Santiago. Young respondents were relatively overrepresented since seven interviewees being 30 years old or less and only two 42 years old or older. The answers from older and younger respondents did not present any noticeable differences. This information is available in Table 1.

The lack of older people may be the reason why only three respondents reported living with children, while all the others lived by themselves or only with their partner. One of the respondents who currently lived alone, however, used to live with children.

While the number of interviews performed is relatively small, such a number allowed to capture a wide range of responses and reaching the point at which the answers of new interviewees would fit within the responses already registered. Despite this, future research implies using these results for developing questionnaires that would allow performing statistical inferences.

Table 1: Information about the respondents

Place of search	Age	Gender	Lives with	Occupation
Wellington	28	Male	Partner	PhD Student
Wellington	61	Female	Alone	University Researcher
Santiago	41	Male	Partner + 6 children	Civil Engineer.
Santiago	34	Male	Partner + 2 children	Lawyer
Santiago	36	Female	Alone	Administrative position in education
Wellington	29	Female	Partner	Business Analyst
Santiago	33	Male	Partner + 3 children	Manager of business
Wellington	33	Male	Partner	Team facilitator
Santiago	32	Male	Partner	Construction specialist
Santiago	37	Female	Alone	Psychologist
Santiago	29	Male	Partner	Psychologist
Santiago	40	Female	Alone	Lawyer (Bank)
Wellington	29	Male	Alone	Public policy officer
Wellington	38	Male	Partner	Software Developer
Santiago	29	Male	Partner	Manager at a business incubator
Wellington	27	Female	Alone	Communications Advisor
Wellington	29	Female	Partner	Lawyer
Wellington	66	Female	Alone	Social Worker on the Health System

Interview structure

Respondents were interviewed one by one in an informal setting. Those in Wellington (New Zealand) were met in person, while those in Santiago (Chile) were interviewed through the phone. All interviews were performed in the respondent's native language. That means that all the interviews performed with Chilean respondents were carried out in Spanish, while most of those in New Zealand were performed in English. Two respondents in New Zealand were native Spanish speakers, thus such interviews were carried out in that language. The interviewer—who is a native Spanish speaker and fluid in English—translated the data into English before processing.

All interviews were confidential, and the respondents were assured that no data that could be used to identify them was going to be published. The audio of the interviews was recorded, but it would only be used for data processing purposes and not published at all.

This interview started by asking some demographics and a set of warmup questions. Among the warmup questions, respondents were asked whether they received information about IEQ attributes themselves and whether they trusted such information. After finishing with the warmup questions, respondents were asked to “please describe a warm dwelling” and “please describe a dwelling with good natural light”. Statements showing whether people value IEQ attributes or not were gathered from the provided description.

While respondents were answering, the interviewer took notes in the format of a mind map. Respondents were encouraged to participate and correct any misinterpretations. This mindmap would then be refined by using the audio from the interview and also sent to the respondents for their approval.

Data analysis

The data gathered was checked by the respondents both during the interview (when the interview was made in person) and after it was digitalized. This means that the respondent became a second analyst, thus triangulating the data obtained (Patton, 1999). Also, the validity of the information was constantly contrasted with building science theory, thus performing a theoretical triangulation (Patton, 1999).

The data was analysed through a Thematic Analysis as explained by Braun and Clarke (2006, 2012). This implied coding the interviewees' responses to represent different kinds of answers. After coding, themes were identified and reviewed, which often led to the identification of new codes and themes. The results from this iterative process were finally expressed in the form of a narrative—presented below—in which codes of each theme are grouped together along with their meaning.

RESULTS

This section presents the results of the interviews. As mentioned earlier, respondents were asked (1) whether people value IEQ attributes and (2) whether they trust the information about IEQ attributes they receive during their search for homes. Nonetheless, as mentioned earlier, question 1 is divided into two components: do people value Daylight? And do people value Warmth?

Do people value Daylight?

Our results highlight that consumers value daylight, as they often mentioned the benefits of having good natural light on their lives. For example, respondents mentioned things like “there is nothing nicer than using the natural light” (Respondent 13, Santiago), “I much prefer natural lighting to artificial lighting” (Respondent 16, Wellington) and “natural light is more pleasant for living it than the fake one” (Respondent 3, Santiago). According to them, daylight “directly impacts your quality of life” (Respondent 13, Santiago) because “otherwise you go inside and it just feels depressing” (Respondent 12, Wellington). As stated by Respondent 8 (Santiago), daylight “is happiness, it is life” and “it is good for your body and your soul”.

Among other reported benefits, respondents mentioned that dwellings feel “more spacious if you have a lot of daylight” (Respondent 7, Wellington), that “[a dark place] definitely feels more enclosed and smaller” (Respondent 7, Wellington), and that spaces simply look better with daylight. For instance, Respondent 10 (Santiago) argues that “in a dark house you do not see the corners. You cannot see things as they should be”. Respondent 13 (Santiago) agrees with this when using the Chilean expression “during the night, all cats are black”.

It is worth noticing that the value of daylight does not seem to be strongly related to its energy-saving attributes, but to its health and wellbeing benefits. For instance, Respondent 5 (Santiago) argues that “daylight has the practical role of heating, and obviously also a liveability one”. However, “the savings in electric lighting are debatable today because you almost do not spend in that”.

Do people value Warmth?

Just like in the case of daylight, respondents were never directly asked whether they valued warmth or not. However, they offered several answers that allow inferring that they do it.

First, a warm house is said to offer certain freedom that a cold house does not. Respondent 13 (Santiago), argues that “in a cold house, in the end, you isolate yourself because you will be under five blankets with a hot water bottle”. In a similar manner, Respondent 1 (Wellington) remembers that, in her previous house, “you would be sort of closing all the doors and turn [into] the one room where [the heater] was”. Respondent 18 (Wellington) on her part, states that one of the benefits of warmth is “to be able to use the whole house because it is all equally comfortable”. Respondent 11 (Santiago) says that, as opposed to a cold dwelling, there is “no need for running from one place to another because you freeze” in a warm one.

Those who have children extend the benefits of warmth to the wellbeing of their family. For instance, Respondent 5 (Santiago) states that “[warmth] is very relevant! I, every time I go to the bathroom [at night]... go check the little kids” because he is scared “of the children getting uncovered during the night”. Respondent 9 (Santiago) agrees with this when saying that “it is you, your wife and the kids... if you are fine, they are probably feeling the same”. Respondent 3 (Santiago) provides a more categorical answer by saying that “when you do not have children, cold does not matter... I do not care about cold if I am not with my kids... a warm house allows them to go through the winter better”.

Do you trust the information about IEQ attributes when it is available?

Respondents appear to know that whoever is trying to sell the dwelling has an incentive to exaggerate certain attributes as long as those claims are not legally binding or have bad consequences for the company or person. Scepticism seemed to be the most common reaction towards information about IEQ attributes provided by sellers and agents.

For instance, Respondent 1 (Wellington) argues that she would trust the information they provided depending on “who [are] they? If was the vendor, no”. Respondent 9 (Santiago) argues something similar and adds “if it is the agent, who needs the money [then no]. In a similar manner, Respondent 11 (Santiago) said that she would not believe information “if it is the owner who says it”. Respondent 18 (Wellington), on her part, responded with a categorical “No. No. No. No, absolutely no. You have to go and see it... I actually had a compass for a while, to figure out where the sun would come. No, totally, real estate agents you do not believe a word they say”. Respondent 15 (Wellington) expressed something similar, saying that “I do not need them to tell me things because I do not believe them”. Respondents either did not trust the information provided by any person who was profiting by selling the property (e.g. owner, agent, developer, etc.), or they would check any information provided.

Thus, the verifiability of the information is considered relevant. Respondents would “trust up to a certain point. But if there are any worrying details, most of the time you would get your own Builders Report” (Respondent 2, Wellington). Respondent 5 (Santiago) stated something similar. Specifically, that “in general, [I do not trust the information] so much. I mean, I study it. I see the support that it has”. Respondent 6 (Wellington), on his part, mentions that he might initially trust the information about IEQ attributes in the property listings. However, he mentioned that “we would never go and [say] ‘Oh, but they said it had a lot of light and we didn't get the impression... but if they say it [then it must be true]’”. Respondent 7 (Wellington), summarizes this by saying that “a lot of it, I just trust my own intuition”. Thus, respondents might trust the given information if their intuition does not contradict such information. For instance, Respondent 13 (Santiago) states that “Like, to really trust? No. But... the apartment I bought, due to its orientation, I trusted”.

There are two cases in which respondents expressed trust: when information is trivial to verify (i.e. there is no point in lying) and when exaggerating claims is not convenient (i.e. when lying can become a problem). Respondent 12 (Wellington), for instance, mentions that “if [the claim] is something like ‘It has a heat pump’ then you can trust it because that is quite specific”. Respondent 14 (Wellington) states that she would trust the moisture test “because it was done with objective equipment to measure that. Insulation [can also be trusted]

because it is a legal requirement”. Respondent 11 (Santiago) expressed that, whether she trusts the information provided or not, “depends on the company... [I might trust big] companies. But, if the listing says 'I sell my apartment' I do not believe anything”. The reputation of the company is considered along with the risk of ruining it.

Some respondents also showed some concerns regarding the possibility of making claims about subjective matters, such as warmth and the quality of daylight. For instance, Respondent 3 (Santiago) said that, even if he was given a certain objective measure, “I would still need to check it out. I mean, I would need to perform a personal revision, because this thing of 'properly illuminated' or 'poorly illuminated' is very relative”. Likewise, Respondent 12 (Wellington) said that “what does that mean? ... I do not know what Warm means to you, because to me, I like a really warm house”. This is not a problem of scepticism, but it is definitely something to deal with when disclosing information.

Finally, several respondents said that the information would be more trustworthy if certified by third-party entities (i.e. through *quality disclosure*). Respondent 1 (Wellington) answered such a question by stating that she would trust this information if it came from “something like an engineer or a builder, yeah... Hmm, or something like a sustainability trust report or something like that”. Respondent 4 (Santiago), on his part, declares that these mechanisms help “because that gives you a certain guarantee that they are committed to it”. The third-party to still need to be trustworthy. For instance, Respondent 16 (Wellington) states that she “would still want to verify. If there are 20 years down the track, and like this, you know, this regulation get held up, and sort of being defended in court and things like that, then yeah, totally, that would help”. Likewise, Respondent 18 (Wellington) states that she “would want to know how [the certification] is developed. Like, who developed it”.

DISCUSSION

The previous sections presented the different answers provided by respondents, identifying certain patterns. In general, two main themes can be highlighted: First, respondents from both Wellington (New Zealand) and Santiago (Chile) seem to value the attributes of Warmth and Daylight. They provided different reasons for each of those attributes, most of them being related to their general quality of life, health and wellbeing.

The second theme is that a clear distinction was identified between housing features that help improving IEQ attributes (i.e. *search* attributes) and the IEQ attributes themselves (i.e. *experience* attributes). This distinction is evidenced by the level of scepticism that respondents report towards the claims related to different attributes. Namely, they would trust claims about features such as a heat pump, but they would not trust claims about warmth. Thus, the concepts explained in the introduction—related to the Economics of Information—are considered suitable for approaching this research and are expected to help to perform relatively accurate predictions in future studies. The suitability of such concepts is also supported by the fact that consumers will distrust some information depending on who provides it. Specifically, on whether the source is profiting from the transaction—and thus have incentives to exaggerate certain good attributes of the dwelling—or not. Additionally, respondents mentioned that *quality disclosure* can reduce the scepticism towards claims, which is also a prediction from the Economics of Information theory.

It is proposed that the reason why consumers seem to disregard warmth and natural light from the final purchase decision is not that they do not value those attributes, but that they cannot do it because those attributes are hardly assessable during a normal home-searching process. Namely, consumers can identify a sunny neighbourhood by observing the obstructions and orientation of the street. On the contrary, they are incapable of identifying which of the dwellings in such a neighbourhood or street is the warmest one. Also, while they can use their intuition to infer whether a dwelling is warm or not, they unlikely to be able to tell which of all the dwellings they visited is warmer. Unable to make these distinctions, consumers simply cannot make choices at a per-house level unless they are given the information about IEQ attributes, which needs to be properly communicated in order to reduce their scepticism.

CONCLUSION

Based on a literature review, this paper argued that consumers seem to be willing to pay more for dwellings that are located in neighbourhoods with high environmental quality while simultaneously disregarding IEQ attributes of dwellings. Why would consumers value IEQ attributes when selecting a neighbourhood to only disregard them when making their final choice of a house?

First, the literature led to conceptualizing IEQ attributes as characteristics of dwellings that are hardly assessable during a normal home-searching process. Consequently, consumers can only acquire information about IEQ attributes if it is provided by the vendors. Second, the analysis of the respondents' answers led to suggestions that consumers indeed value the specific IEQ attributes of Warmth and Daylight. Nonetheless, claims about IEQ attributes made by vendors are subject to high scepticism. This scepticism might be reduced by having a third-party to certify the information about IEQ attributes.

Consequently, disclosing IEQ attributes in a way that consumers find valuable, useful and trustworthy might help consumers to consider such attributes during their purchase decisions. While defining what is it about IEQ attributes that consumers find useful and valuable is considered future research, our results suggest that having a third-party to certify the information might increase its trustworthiness.

Disclosing IEQ attributes of dwellings to consumers could benefit real estate agents, architects, developers and construction companies as they could use IEQ attributes to create value and differentiate themselves from their competition. This would encourage the industry to invest on IEQ attribute, increasing the quality of the housing stock and thus improving people's health and wellbeing.

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