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Does environmental quality play a role in determining housing prices in a coastal community?

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Abstract

Buying a house is one of the most common forms of investment worldwide. People often choose to invest in property not only for its potential financial return, but also because owning a home can contribute significantly to long-term stability and quality of life. While satisfaction with housing conditions is important for overall well-being, this is not necessarily what motivates a purchase. In addition to serving as a residence, property ownership can offer financial benefits if the owner decides to sell or rent it in the future. The first evaluation of the house (which is usually executed together with the real estate agent) is reflected in the willing-to-sell price published in the property sale ads or, as we name it here, property price perception. In this study, we investigated whether the local environmental conditions (presented by coastal seawater quality measured objectively and subjectively) affect the price perception, together with traditional factors affecting the first price evaluation (such as the house and property area and year of construction, etc.) in Raseborg, Finland. We found that prices in ads for houses and cottages listed for sale in the high-peak season were higher in places where the objective state of seawater was in better condition. These results demonstrate that owners and real estate agents consider the natural conditions in their first property evaluation and underline the potential financial reward of local nature for community members and policymakers.

Keywords: life satisfaction, local environment, property price perception, Baltic Sea, environmental monetary value

Introduction

The purchase of own property, such as a house or cottage, is one of the important milestones in human life. Most people do it only a few times in their lives, and a significant share of the population purchases their own property only once in life (Benmelech et al., 2023). Thus, the process of selection of the property is complex, and the price of the property includes many factors accounted for by both parts of the process: seller and buyer (Ullah & Sepasgozar, 2020). Owning own property is a significant part of achieving well-being standards (Munford et al., 2020). On top of that, owning a house reflects personal control and a sense of security (Foley, 1980). In some countries, owning a house is closely tied to social status and is seen as a symbol of financial security and success (Hu & Ye, 2020; Wei et al., 2017). More broadly, housing plays a central role in people's lives across many OECD countries, where it accounts for a significant share of monthly expenses (OECD, 2020). Furthermore, the loss of stable housing has been linked to both mental

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and physical health problems (Qouta et al., 1998).

The quality of housing conditions is one of the key factors affecting the quality of life of people (Girouard et al., 2006; Rolfe et al., 2020; OECD, 2020). The state of housing conditions is a social determinant of public health and a vital component in the link between poverty and health (Shaw, 2004). Poor housing conditions can seriously harm health and be a source of infection and chronic diseases, injuries, and it can affect child development (Krieger & Higgins, 2002). Therefore, improvements in housing conditions are expected to lead to improvements in mental health of the person (Thomson et al., 2009). The proximity to natural environments has similar positive effects on individuals (Berto, 2005; Ulrich et al., 1991; White et al., 2019), and the perception of a good quality environment plays a significant role in overall life quality (Gunko et al., 2022a). Furthermore, adequate housing conditions and the proximity to natural areas have additive positive effects on well-being (Carmona, 2018; Wells & Evans, 2003).

The pricing of properties is constantly increasing around the globe since the mid-20th century (Knoll et al., 2017), and the pandemic of COVID-19 provoked the biggest housing boom since 2006 (Knight Frank, 2021). In Finland, long-term data shows that housing prices have generally trended upward, with an average annual increase of 1.8 per cent since 1905 (Knoll et al., 2017). However, this overall growth masks significant fluctuations, including periods of sharp increases and declines, particularly around major historical events. The established selling price is a complex value which includes numerous variables, such as e.g., details of the house conditions and features, infrastructure accessibility, neighbourhood quality, and market conditions, which all contribute to a final value (Fan et al., 2006; Filippova & Rehm, 2014; Kuşan et al., 2010; Wittowsky et al., 2020). These factors can vary largely among countries and between localities within countries. The housing market in Finland tends to be volatile due to high reliance on mortgage rates, property taxation and supply availability (André & García, 2012). Moreover, housing prices can differ significantly within regions in Finland due to such factors like level of development of the area and housing demand (e.g., metropolitan area) (Oikarinen, 2007). On top of that, global or local difficulties in the economic situation can cause housing price reduction related to reducing to the demand from potential buyers (van Doorn et al., 2019). Contrary, global stress such as COVID-19 can cause price increments but to different extents depending on local features (e.g., market trends) of the country (Nyholm & Ahoniemi, 2022).

Nevertheless, the owner's price perception (hereafter, PP) plays the most important role in the finalisation of the price the owner is willing to sell for (Rahadi et al., 2015; Hoe et al., 2018). PP is related to the perception of the above-mentioned factors, which affect the price, and it reflects a subjective evaluation of the housing conditions. Often, PP is covertly reflecting the salesperson's experience with the neighbourhood and also includes aspects of the surrounding environmental conditions (Berezansky et al., 2010; Salvi, 2008). Kiel and Zabel (2003) concluded in their study that owners often overvalued their houses by 5.1 per cent in comparison to the eventual sales price, and this overevaluation was not related to any specific house characteristic. This PP overevaluation is likely explained by the owners' experience with the house and neighbourhood, their attachment to the property and knowledge about the local house market (Goodman & Ittner, 1992).

The role of environmental conditions in property price formation is continuously rising (Luttik, 2000), where accessibility to water bodies has one of the biggest impacts on the price formation (Kaplan & Kaplan, 1989). The easy access to water features is usually a matter of increasing housing and property prices (Cho et al., 2006). Nevertheless, in cases where the water quality is inadequate, the accessibility to water bodies can have a negative impact on the property price (Leggett & Bockstael, 2000). In a review on this topic, Boyle and Kiel (2001) found that the state of the water in the closest waterbody to the house affects the housing price, but the final monetary value of the impact fluctuated among different areas. The direction of this effect depends on the objectively measured observable characteristic of water quality (e.g., water clarity). Additionally, there is evidence of the ability of people to perceive observable water quality characteristics with a high level of accuracy (Gunko et al., 2022b). Thus, subjectively measured water quality is expected to be important in housing price formation.

In Finland and in the other Nordic countries, it is common to own a second home (cottage) and this has historical and cultural reasons (Pitkänen, 2011). The number of cottages in Finland is continuously rising on average by 10,000 per 5-years period (OSF, 2020), and they are important for recreation (Pouta et al., 2006; Salmi et al., 2006). Additionally, the popularity of owning a summer cottage in Finland increased among foreign tourists, especially among Russians, which were involved in 70 per cent of real-estate operations with foreign buyers/sellers in the country between 1977 and 2010 (Lipkina, 2013). One of the main motives when selecting cottages is access to untouched and clean nature, water bodies of high quality, forest or rural landscape and outdoor activities (Jaakson, 1986; Sievänen et al., 2007; Rantala & Puhakka, 2019). Due to the recreational importance of cottages, the state of the immediate environment is vitally important and is thus predicted to be one of the most important factors contributing to cottage price formation.

In this paper we investigate the relationship between house price perceptions and environmental conditions (water quality) in a small coastal community during the high peak season. Our aim is to understand if the environment plays a role in price perception. Since housing conditions are associated with well-being (Bond et al., 2012; Kearns, 2022) and well-being is associated with environmental quality (Gunko et al., 2022a; 2022b), we predict that housing prices should be determined by environmental quality. As an environmental quality factor in this study, we use objectively measured values (oWQ) of fluorescent dissolved organic matter (fDOM), and as addition to the study, we use indirectly measured subjective estimates of water quality (sWQnw) by inhabitants living in the area close to the properties. Price perception is represented by prices collected from an open-source real-estate advertisement web-platform. We predict a strong positive relationship between oWQ and PP, as well as a link between sWQnw and PP.

Methods

The study area, Raseborg municipality, is located in South-West of Finland on the Baltic Sea shoreline. It is one of the largest municipalities in Uusimaa region by total area. Due to its location and close distance to the capital region, Raseborg is a popular place among people working in Helsinki and the surrounding areas where to buy a detached house. Moreover, Raseborg is important as a place for recreation and remains one of the most popular municipalities in Finland by the number of cottages (OSF, 2020). However, the share of permanently occupied detached houses is higher in our study area (57,2% vs 42,8%) and the number of sale ads for houses is significantly higher (e.g., in June 2024: 162 houses vs 91 summer cottages) (OSF, 2023a; OSF, 2023b).

The price perception data was collected through the Finnish real-estate web-platform Oikotie (https://www.oikotie.fi/) during May-September 2021. The period of data collection is characterized as the high peak season with higher sale prices as compared to other seasons (Cho et al., 2006). Apart from the published selling prices for the detached houses and cottages, we collected data on factors which are important for the price formation and presented in the advertisement (the full list of the collected factors is presented in Figure 1). The main determinant for the data collection was the location of the house or cottage at a maximum distance to the sea of 2000 m. In total, we collected data about 75 houses and 78 cottages from ads that were published for sale (see Figure 2). This number represents 64 per cent of all houses and cottages available on the market in May-September 2021. Later, we excluded from the analysis 33 properties due to a lack of data regarding one of the analysis parameters, ending in having 122 properties (73 houses and 49 cottages).

The water quality data is represented by objective measurement (oWQ) and subjective water quality measurement as supplementary data. We collected the oWQ data by sampling visible water quality variables, such as water turbidity and concentrations of fluorescent, dissolved organic matter (hereafter referred to as fDOM) and chlorophyll a, along with variables depicting the physical environment, such as temperature and salinity.

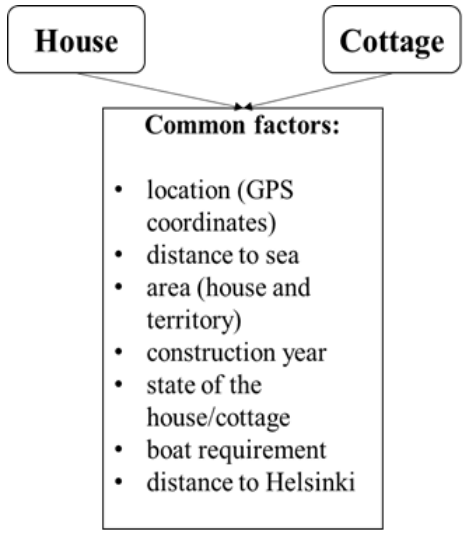

Figure 1. Factors predicted to affect the price formation collected from the open source.

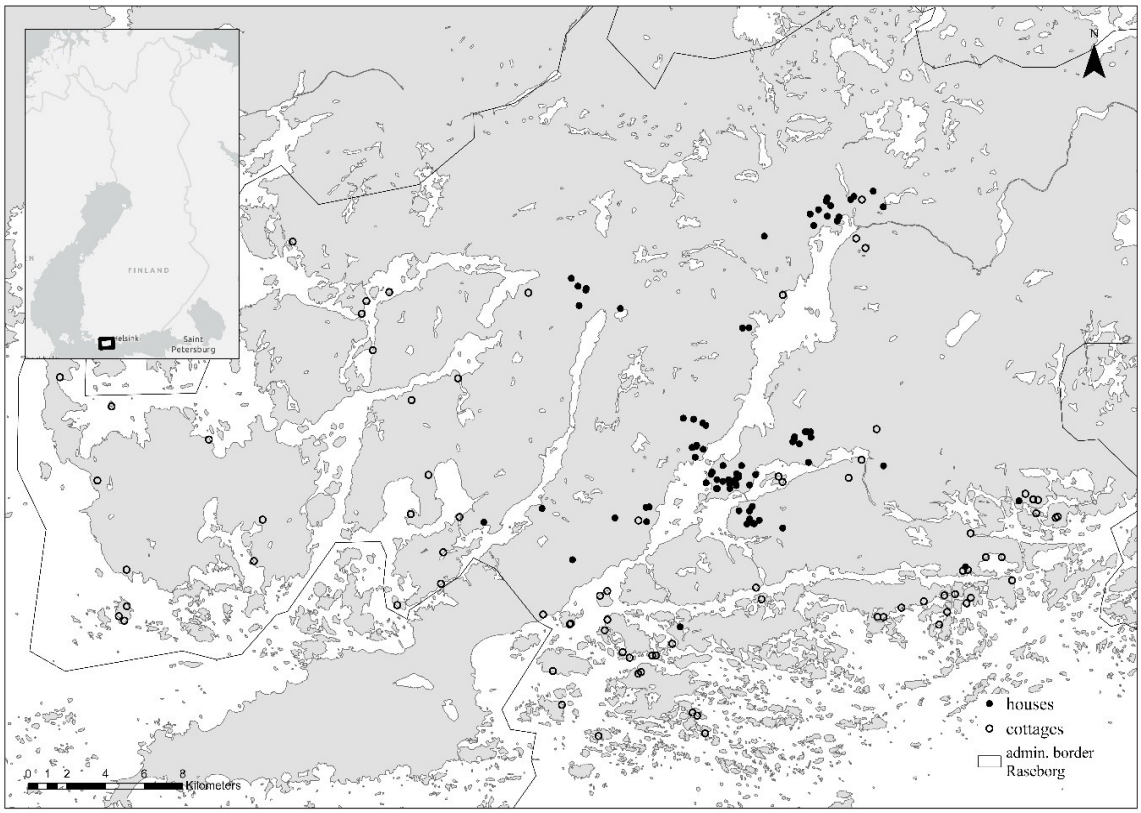

Figure 2. Study area with mapped data collection hotspots: houses (closed circles) and cottages (open circles). Basemaps sources: SYKE, National Land Survey of Finland, Esri, TomTom, Garmin, FAO, NOAA, USGS. Terms of use: CC BY 4.0.

In this paper, we use fDOM concentration as a proxy for the level of organic loading, in accordance with Nixon (1995). These measurements were carried out using an automated underway measurement system equipped with optical sensors, along a coastal transect of approximately 300 nautical miles (550 km), covering the Raseborg archipelago. The oWQ variables were collected by six rounds during April-September 2021. For the analysis, we used the mean value calculated from the data from all rounds. The system was installed in a rigid inflatable boat (Brig N610H) with a 0.4-m draft and water intake at a depth of 0.5 m, enabling the system to operate even in very shallow environments. Data were constantly recorded, together with geospatial referencing information, at 5-second (s) intervals by an EXO2 multiparameter sonde and an associated Handheld Unit (Xylem Inc., United States). Data collection, calibration and handling are described in detail in Scheinin and Asmala (2020). Additionally, each variable was corrected for the statistical analysis using salinity as a way to link observations to the physical characteristics of the environment.

The subjective water quality data were collected using data from the survey conducted in May-July 2021. The survey data were used in our previous studies regarding the effects of environmental perceptions on people's well-being. It is important to mention that the subjective data in this study were not collected by contacting property owners or real estate agents, but rather by using opinions about water quality expressed by neighbours of properties within the boundaries of watersheds (sWQnw). People responded to the question "How would you assess the quality of the water on your property and in its immediate surroundings?" using a range between 0 and 10, where 0 means low quality of water and 10 means high quality of water. We then calculated the mean value of all responses that fell within a 2000m buffer around the point corresponding to the main house/cottage on the property.

The objective and subjective data were transferred to ArcGIS Pro. The oWQ values were extracted from the closest point value to each property (for fDOM and salinity) from interpolated rasters by using the Diffusion Kernel method, with the land as a barrier. Next, we constructed a variable based on residuals between fDOM and salinity. Salinity was used as a proxy of how open or closed the water basin was, since more closed waters have a higher level of freshwater input and are expected to have higher values of fDOM (Asmala et al., 2014). The sWQnw data were obtained by calculation of mean values for water quality assessment expressed by neighbours of watershed falling in 2000m buffer around the point corresponding to the main building on the property. Thus, each property point (house or cottage) had oWQ and sWQnw measures. For the calculation, we used ArcGIS Pro 2.8 software.

Table 1. List of linear models used in the analysis.

Model	Response variable	Explanatory variables
1	House price perception	oWQ + Distance to sea + Distance to Helsinki + Area (house) + Area (territory) + Year of construction + State of the house + Boat requirement + Type of the property
2	House price perception	sWQnw + Distance to sea + Distance to Helsinki + Area (house) + Area (territory) + Year of construction + State of the house + Boat requirement + Type of the property

For the analysis, we used linear models with normal errors to test whether oWQ can explain the variation in the property price. Our main goal was to understand the role of environment in the perception of the property price by owners/real-estate agents. The house and cottage prices are analysed together. As a supplement to the objective environmental data analysis, we used sWQnw by testing whether indirectly collected subjective environmental data can explain the price perception of the property owners/real estate agents. In addition to the environmental factors we used as explanatory factors: house area, related to house territory area, year of house construction, state of the house (subjective measurement derived

from the house photo assessment; includes three level assessment: requires immediate renovation, doesn't require immediate renovation and freshly renovated), boat requirement (the factor explains if the owner required to have boat to access the cottage), distance to the sea water and distance to Helsinki (Bogin et al., 2018; Cho et al., 2006; Galati et al., 2011; Limsombunchai, 2004; Pitkänen, 2008; Wilhelmsson, 2008) and a variable described the type of the property (house or cottage) (see details in Table 1). The data used for the analysis has substantial variation (see Table 2). The continuous variables (price perception and oWQ residuals) were standardised. All models were run using R statistical software v. 3.6.1. (R Core Team 2014).

Table 2. Descriptive statistics of the variables used in the models.

	Distance to sea (m)		**Distance to Helsinki (km)**		**Area (house) (m²)**		**Area (territory) (m²)**	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Houses (N = 73)	665,1	485,4	91,7	4,7	149,3	78,4	2506,3	3171,6
Cottages (N = 49)	202,7	277,8	104,1	13,1	67,4	42,1	22311,4	32833,2
Total (N = 122)	479,4	471,7	96,7	10,9	116,4	77,4	10362,9	22867,3

Table 2. (Continued.)

	oWQ		**sWQnw**		**Price (euro)**	
	Mean	SD	Mean	SD	Mean	SD
Houses (N = 73)	-0,4	2,6	7,5	0,5	287732,9	255227,2
Cottages (N = 49)	0,1	6,7	7,5	0,9	284591,8	231203,8
Total (N = 122)	-0,2	4,6	7,5	0,7	286471,3	244886,3

Results

According to our data collected during the peak season, the average perceived price of the houses was 1961.7 euro/m², which is slightly higher than the average selling price in Raseborg (1603 euro/m²) in 2021 (OSF, 2021).

We tested whether oWQ can explain the price perception of the house property. The correlation between objective and subjective WQ variables is weak and negative ($r = -0{,}181$; $dF = 120$; $p = 0{,}046$). In the first model, we found that oWQ had a significant positive effect on the price perception (Table 3; Figure 3). At the same time, we found a strong positive effect of the area of the house and the area of the property state of the house (liveable and renovated houses have higher PP) and a positive effect of the year of construction (newer houses had higher PP). The distance to the sea from the house had a negative effect where houses located closer to sea had higher prices. Houses which required a boat had lower PP. The distance to Helsinki did not affect PP (Table 3).

*Table 3. Linear model of the relationship between price perception and oWQ. In the model state of the house presented by three groups (1 – requires renovation, 2 – liveable, 3 – fully renovated), boat requirement factor presented by three groups (1 – no need of boat, 2 – need, 3 – ferry connection). R2 marginal = 0.477 and R2 conditional = 0.477. The significance of each estimate (t test) is presented as *** p<.001, ** p<.01, * p<.05 and (*) P<0.1, P values are presented in bold.*

Dependent variable	Independent Variables	Estimate ± SE	DF	F	P
House price perception	Intercept	**-7.485 ± 3.414***			
	oWQ	**0.144 ± 0.069***	1	4.556	**<.05**
	Distance to sea	**-0.001 ± 0.001*****	1	19.293	**<.001**
	Distance to Helsinki	0.002 ± 0.006	1	0.062	0.803
	Area (house)	**0.005 ± 0.001*****	1	38.400	**<.001**
	Area (territory)	**0.001 ± 0.001*****	1	18.900	**<.001**
	Year of construction	**0.003 ± 0.002 (*)**	1	11.102	**0.001**
	State of the house	**Liveable 0.657 ± 0.261*; Renovated 1.276 ± 0.319*****	2	10.416	**<.001**
	Boat requirement	**Need -0.510 ± 0.189**;** Ferry -0.085 ± 0.304	2	4.077	**<.05**

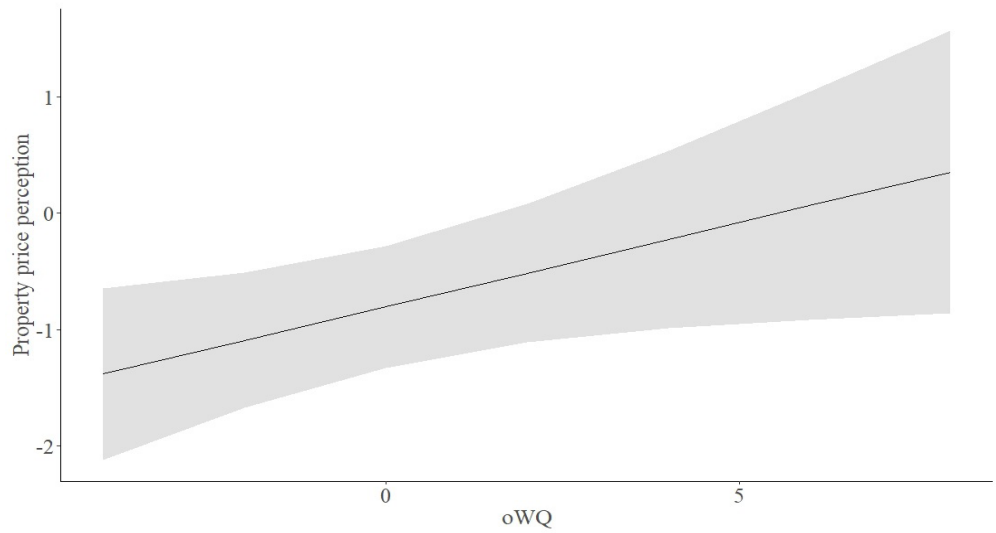

Figure 3. The relationship between oWQ and price perception gradients for houses and cottages. Price perception is standardized measurement of price in euro; oWQ is standardized measurement of fDOM residuals.

For the additional analysis, in a second model we replaced oWQ with sWQnw. We found that the perception of environmental conditions by people living in the same watershed where property is located had no significant effect on the price perception. The other factors showed the similar trend to the findings in the first model (details in Table 4).

*Table 4. Linear models of the relationship between price perception and sWQnw. In the model state of the house presented by three groups (1 – requires renovation, 2 – liveable, 3 – fully renovated), boat requirement factor presented by three groups (1 – no need of boat, 2 – need, 3 – ferry connection). R2 marginal = 0.430 and R2 conditional = 0.430. The significance of each estimate (t test) is presented as *** p<.001, ** p<.01, * p<.05 and (*) P<0.1, P values are presented in bold*

Dependent Variable	Independent Variables	Estimate ± SE	DF	F	P
House price perception	Intercept	-5.929 ± 3.816			
	sWQnw	0.013 ± 0.103	1	0.014	0.906
	Distance to sea	**-0.001 ± 0.001****	1	16.825	**0.001**
	Distance to Helsinki	0.001 ± 0.008	1	0.356	0.552
	Area (house)	**0.004 ± 0.001*****	1	25.058	**<.001**
	Area (territory)	**0.001 ± 0.001*****	1	11.767	**<.001**
	Year of construction	0.002 ± 0.002	1	7.611	**<.01**
	State of the house	**Liveable 0.671 ± 0.284*; Renovated 1.331 ± 0.341*****	2	8.494	**<.001**
	Boat requirement	**Need -0.4491 ± 0.240*;** Ferry 0.066 ± 0.351	2	3.388	**<.05**
	Type of the property	0.026 ± 0.225	1	0.013	0.909

Discussion

Housing conditions are one of the factors affecting people's well-being through the effect on health and perceptions (Krieger & Higgins, 2002; Thomson et al., 2009; Rolfe et al., 2020; OECD, 2020). The desire for adequate housing conditions is a worldwide phenomenon (Munro & Littlewood, 1998; Smith & Smith, 2004). Besides objective factors constituting the state of the housing (e.g., size or state of the property) also aesthetic values of the property plays a big role for satisfaction with the house. The crucial for that is the natural environment linked to the property (located close by or at a reasonable distance). The objective and aesthetic values form the materialistic value of the house, which is important for the market (Boyle & Kiel, 2001; Cho et al., 2006; Walsh et al., 2017). The aim of our study was to investigate whether the quality of the environment (water quality) affects the price perception of the property and if this effect has an objective or subjective dimension. Our findings confirmed our expectations about a positive effect of the state of the environment on the property price perception. Houses and cottages located in the areas with better oWQ had higher prices in the market advertisements. This supports previous findings (Artell, 2013; Bin

& Czajkowski, 2013; Walsh et al., 2017), but our study shows the connection from a different perspective since most of the scholars used fixed property prices in their studies (data of sold property) and our study demonstrate that people responsible for the price formation are aware about the state of local environment. The strong positive effect of oWQ highlights that real estate agents and owners take into account the environmental conditions when setting a price. We consider that the majority of people involved in the formation of the price published in the advertisements do not have any scientific background. This finding is in line with our previous findings, where we find that people are well able to evaluate the state of WQ conditions (Gunko et al., 2022b). Additionally, we argue that the wish to increase the property price in the future can be potentially one of the drivers and motivations of owners (potential sellers) being involved in the conservation actions for nature surrounding the property. The argument for that is the positive linkage between financial rewards for stakeholders and participation in and/or promotion of environmental protection (Kaiser et al., 2020).

In our study, we found that PP decreased with increased distance to the sea, which corroborates the high value of access to sea water in this coastal archipelagic community and the importance of the aesthetic values of nature. According to previous findings, interaction with the sea water benefits people's well-being in physical and mental health dimensions (Wheeler et al., 2012; White et al., 2013). At the same time, we did not find an effect of the property type (house or cottage) on PP and in connection to the distance to sea water we expected to see higher PP for cottages based on previous findings about the potentially higher aesthetic value of cottages located nearby water and its popularity (Häkkänen et al., 2022; Salmi et al., 2006). We argue that this can be due to the relatively small sample size oriented on a property sales peak in the study area.

As an addition to our main research question, we explored the association between property price perceptions and subjective evaluations of the state of environment (water quality assessment based on the opinions of neighbors of properties within the boundaries of watersheds). We did not find that subjectively measured environmental conditions collected indirectly were associated with PP in our study. It is important to highlight that we did not ask people involved in the price formation to subjectively evaluate environmental conditions. The results regarding sWQnw are contrary to our prediction, which is based on the previous finding that perceived water quality around the property is positively associated with well-being (Gunko et al., 2022a). We assume that the absence of this effect may be due to the fact that we here used estimates of sWQnw assessed by people living in the vicinity of the property (residents of the study area), and not the estimates of those people who determined the prices (sellers and real estate agents). Nevertheless, we assume that people involved in price formation (owners and real estate agents) use their environmental perceptions during the property assessment process. Previous findings showing that people are generally accurate in their environmental evaluations (Gunko et al., 2022b) convince us that this may also be the case here, which is why we see connections between objective environmental measures and price perceptions. However, we are convinced that this requires a separate study, where subjective data could be collected by directly approaching the people involved in price formation.

Conclusions

Our findings highlight the significance of local environmental conditions in people´s price perception. It indicates that environmental quality is assessed by the sellers and real estate agents in the property evaluation when determining selling prices. Our results are in line with previous documentation of the role of the environment for property prices (Artell, 2013; Bin & Czajkowski, 2013; Walsh et al., 2017) but demonstrates that the state of the local environment is considered by people responsible for the PP (owner and real-estate agent) from the first evaluation of the selling price. It also shows that adequate natural conditions can bring potential financial benefits and can be a motivation for active participation of property investors in environmental protection. Finally, our results serve as a signal for local councils about the

significance of active monitoring of the state of the local environment and conservation programs since this has the potential to attract new investors and inhabitants to the community.

References

André, C., & García C. (2012). Housing price and investment dynamics in Finland. *OECD Economics Department Working Papers*, 962. OECD Publishing, Paris.

Artell, J. (2013). Lots of value? A spatial hedonic approach to water quality valuation. *Journal of Environmental Planning and Management*, *57*(6), 862–882. https://doi.org/10.1080/09640568.2013.772504

Asmala, E., Bowers, D.G., Autio, R., Kaartokallio, H., & Thomas, D.N. (2014). Qualitative changes of riverine dissolved organic matter at low salinities due to flocculation. *J. Geophys. Res. Biogeosci*., 119, 1919–1933. https://doi.org/10.1002/2014JG002722

Benmelech, E., Guren, A., & Melzer, B. T. (2023). Making the house a home: The stimulative effect of home purchases on consumption and investment. *The Review of Financial Studies*, *36*(1), 122–154. https://doi.org/10.1093/rfs/hhac041

Berezansky, B., Portnov, B., & Barzilai, B. (2010). Objective vs. perceived air pollution as a factor of housing pricing: A case study of the greater haifa metropolitan area. *Journal of Real Estate Literature*, *18*(1), 99–122.

Berto, R. (2005). Exposure to restorative environments helps restore attentional capacity. *Journal of Environmental Psychology, 25*(3), 249–259. https://doi.org/10.1016/j.jenvp.2005.07.001

Bin, O., & Czajkowski, J. (2013). The impact of technical and non-technical measures of water quality on coastal waterfront property values in South Florida. *Mar. Resour. Econ*., 28, 43–63. http://dx.doi.org/10.5950/0738-1360-28.1.43

Bogin, A., Doerner, W., & Larson, W. (2018). Local house price dynamics: New indices and stylized facts. *Real Estate Economics*. https://doi.org/10.1111/1540-6229.12233

Bond, L., Kearns, A., Mason, P., Tannahill, C., Egan, M., & Whitely, E. (2012). Exploring the relationships between housing, neighbourhoods and mental wellbeing for residents of deprived areas. *BMC public health*, *12*(1), 1–14. https://doi.org/10.1186/1471-2458-12-48

Boyle, M., & Kiel, K. (2001). A survey of house price hedonic studies of the impact of environmental externalities. *Journal of Real Estate Literature*, *9*(2), 117–144.

Carmona, M. (2018). Place value: place quality and its impact on health, social, economic and environmental outcomes. *Journal of Urban Design*, 1–48. https://doi.org/10.1080/13574809.2018.1472523

Cho, S.-H., Bowker, J. M., & Park, W. M. (2006). Measuring the contribution of water and green space amenities to housing values: An application and comparison of spatially weighted hedonic models. *Journal of Agricultural and Resource Economics*, *31*(3), 485–507. http://www.jstor.org/stable/40987332

van Doorn, L., Arnold, A., & Rapoport E. (2019). In the age of cities: the impact of urbanization on house price affordability. In Nijskens, R., Lohuis, M., Hilbers, P., & Heeringa, W. (Eds.) *Hot Property: The housing market in major cities*. (3–14). Springer.

Fan, G.-Z., Ong, S. E., & Koh, H. C. (2006). Determinants of house price: A decision tree approach. *Urban Studies*, *43*(12), 2301–2315. https://doi.org/10.1080/00420980600990928

Filippova, O., & Rehm, M. (2014). Market conditions, marketing time, and house prices. *Journal of Housing Research*, *23*(1), 45-55. https://doi.org/10.1080/10835547.2013.12092086

Foley D.L. (1980). The sociology of housing. *Annual Review of Sociology, 6*, 457–478.

Galati, G., Teppa, F., & Alessie, R. (2011). Macro and micro drivers of house price dynamics. *De Nederlandsche Bank Working Paper*, 288.

Girouard, N., Kennedy, M., van den Noord, P., & André, C. (2006), "Recent House Price Develop-

ments: The Role of Fundamentals", *OECD Economics Department Working Papers*, 475. http://dx.doi.org/10.1787/864035447847

Goodman, J. L., & Ittner, J. B. (1992). The accuracy of home owners' estimates of house value. *Journal of Housing Economics*, *2*(4), 339–357. https://doi.org/10.1016/1051-1377(92)90008-e

Gunko, R., Rapeli, L., Vuorisalo, T., Scheinin, M., & Karell, P. (2022a). Does water quality matter for life quality? A study of the impact of water quality on well-being in a coastal community. *Environmental Management*, *70*, 464–474. https://doi.org/10.1007/s00267-022-01673-0

Gunko, R., Rapeli, L., Scheinin, M., Vuorisalo, T., & Karell, P. (2022b). How accurate is citizen science? Evaluating public assessments of coastal water quality. *Environmental Policy and Governance*, *32*(2), 149–157.

Hoe, J., Dastane, O., & Selvaraj, K. (2018). Predicting consumer perception and its impact on purchase intention for residential property market. *Journal of Technology Management and Business*, 5(2), 59-77. http://dx.doi.org/10.30880/jtmb.2018.05.02.007

Hu, M., & Ye, W. (2020). Home Ownership and Subjective Wellbeing: A Perspective from Ownership Heterogeneity. *Journal of Happiness Studies*, 21, 1059–1079. https://doi.org/10.1007/s10902-019-00120-y

Häkkänen, L., Ilgın, H.E., & Karjalainen, M. (2022). The current state of the Finnish cottage phenomenon: perspectives of experts. *Buildings*, *12*(3), 260. https://doi.org/10.3390/buildings12030260

Jaakson, R. (1986). Second-home domestic tourism. *Annals of Tourism Research*, *13*(3), 367–391. https://doi.org/10.1016/0160-7383(86)90026-5

Kaiser, F. G., Henn, L., & Marschke, B. (2020). Financial rewards for long-term environmental protection. *Journal of Environmental Psychology*, 101411. https://doi.org/10.1016/j.jenvp.2020.101411

Kaplan, R., & Kaplan, S. (1989). The experience of nature: A psychological perspective. Cambridge university press.

Kearns, A. (2022). Housing space and occupancy standards: Developing evidence for policy from a health and wellbeing perspective in the UK context. *Building Research & Information*, 1–16. https://doi.org/10.1080/09613218.2021.2024756

Kiel, K. A., & Zabel, J. E. (1999). The accuracy of owner-provided house values: The 1978–1991 American housing survey. *Real Estate Economics*, *27*(2), 263–298. https://doi.org/10.1111/1540-6229.00774

Knight Frank. (2021). *Global house price index, Research, Q1 2021 and Q2 2021.* Knight Frank. Available online: https://content.knightfrank.com/research/84/documents/en/global-house-price-index-q2-2021-8422.pdf (accessed on 8 November 2021).

Knoll, K., Moritz, S., & Steger, T. (2017). No price like home: Global house prices, 1870–2012. *American Economic Review*, *107* (2): 331–53. https://doi.org/10.1257/aer.20150501

Krieger, J., & Higgins, D. L. (2002). Housing and health: Time again for public health action. *American Journal of Public Health*, *92*(5), 758–768. https://doi.org/10.2105/ajph.92.5.758

Kuşan, H., Aytekin, O., & Özdemir, İ. (2010). The use of fuzzy logic in predicting house selling price. *Expert Systems with Applications*, *37*(3), 1808–1813. https://doi.org/10.1016/j.eswa.2009.07.031

Leggett, C. G., & Bockstael, N. E. (2000). Evidence of the effects of water quality on residential land prices. *Journal of Environmental Economics and Management, 39*(2), 121–144. https://doi.org/10.1006/jeem.1999.1096

Limsombunchai, V. (2004). House price prediction: Hedonic price model vs. artificial neural network. *New Zealand Agricultural and Resource Economics Society Conference*, 25–26 June 2004. Blenheim, New Zealand: New Zealand Agricultural and Resource Economics Society.

Lipkina, O. (2013). Motives for Russian second home ownership in Finland. *Scandinavian Journal of Hospitality and Tourism*, *13*(4), 299–316. https://doi.org/10.1080/15022250.2013.863039

Luttik, J. (2000). The value of trees, water and open space as reflected by house prices in the Netherlands. Landscape and urban planning, 48(3–4), 161–167. https://doi.org/10.1016/S0169-2046(00)00039-6

Munford, L. A., Fichera, E., & Sutton, M. (2020). Is owning your home good for your health? Evidence

from exogenous variations in subsidies in England. *Economics & Human Biology*, *39*, 100903. https://doi.org/10.1016/j.ehb.2020.100903

Munro, M., & Littlewood, A. (1998). What future for the right to buy? *Environment and Planning A*, *30*(4), 647–664. https://doi.org/10.1068/a300647

Nixon, S. W. (1995). Coastal marine eutrophication: a definition, social causes, and future concerns. *Ophelia, 41*(1), 199–219.

Nyholm, J., & Ahoniemi, K. (2022). Nordic housing market risks can affect Finland's economy. Bank of Finland articles on the economy. Bank of Finland Bulletin.

OECD. (2020). How's life?: Measuring well-being, OECD Publishing. https://doi.org/10.1787/9870c393-en.

Oikarinen, E. (2007). Studies on housing price dynamics [Doctoral thesis, Turku School of Economics]. https://www.utupub.fi/bitstream/handle/10024/99387/Ae9_2007Oikarinen.pdf?seque

Official Statistics of Finland (OSF). (2020). StatFin. Population structure. Population according to age (1-year) and sex by area, 1972–2019. Retrieved from:
http://pxnet2.stat.fi/PXWeb/pxweb/en/StatFin/StatFin__vrm__vaerak/statfin_vaerak_pxt_11re.px/

Official Statistics of Finland (OSF). (2021). StatFin. Average prices of old dwellings in housing companies (eur/m2) and numbers of transactions by postal code area and year of construction by Building type, Year of construction, Postal code, Information and Year. Retrieved from:
https://pxnet2.stat.fi/PXWeb/pxweb/en/StatFin/StatFin__asu__ashi__vv/statfin_ashi_pxt_112q.px/

Official Statistics of Finland (OSF). (2023a). StatFin. Number of buildings by intended use and year of construction, 2023. Retrieved from:
https://pxdata.stat.fi/PxWeb/pxweb/en/StatFin/StatFin__rakke/statfin_rakke_pxt_116g.px/

Official Statistics of Finland (OSF). (2023b). StatFin. Number of free-time residents by region, 1970-2023. Retrieved from:
https://pxdata.stat.fi/PxWeb/pxweb/en/StatFin/StatFin__rakke/statfin_rakke_pxt_116j.px/

Pitkänen, K. (2008). Second-home landscape: The meaning(s) of landscape for second-home tourism in Finnish lakeland. *Tourism Geographies*, *10*(2), 169–192. https://doi.org/10.1080/14616680802000014

Pitkänen, K. (2011). Contested cottage landscapes: Host perspective to the increase of foreign second home ownership in Finland 1990-2008. *Fennia-International Journal of Geography, 189*(1), 43–59.

Pouta, E., Sievänen, T., & Neuvonen, M. (2006). Recreational wild berry picking in Finland—Reflection of a rural lifestyle. *Society & Natural Resources*, *19*(4), 285–304. https://doi.org/10.1080/08941920500519156

Qouta, S., Punamäki, RL. & Sarraj, E.E. (1998). House demolition and mental health: Victims and witnesses. *Journal of Social Distress and the Homeless*, 7, 279–288. https://doi.org/10.1023/A:1022995428517

Rahadi, R. A., Wiryono, S. K., Koesrindartoto, D. P., & Syamwil, I. B. (2015). Factors influencing the price of housing in Indonesia. *International Journal of Housing Markets and Analysis*, *8*(2), 169–188. https://doi.org/10.1108/ijhma-04-2014-0008

Rantala, O., & Puhakka, R. (2019). Engaging with nature: nature affords well-being for families and young people in Finland. *Children's Geographies*, 1–14. https://doi.org/10.1080/14733285.2019.1685076

Rolfe, S., Garnham, L., Godwin, J., Anderson, I., Seaman, P., & Donaldson, C. (2020). Housing as a social determinant of health and wellbeing: developing an empirically-informed realist theoretical framework. *BMC Public Health*, *20*(1). https://doi.org/10.1186/s12889-020-09224-0

Salvi, M. (2008). Spatial estimation of the impact of airport noise on residential housing prices. *Swiss Journal of Economics and Statistics*, *144*(4), 577–606. https://doi.org/10.1007/bf03399267

Salmi, P., Toivonen, A.-L., & Mikkola, J. (2006). Impact of summer cottage residence on recreational fishing participation in Finland. *Fisheries Management and Ecology*, *13*(5), 275–283. https://doi.org/10.1111/j.1365-2400.2006.00503.x

Scheinin, M., & Asmala, E. (2020). Ubiquitous patchiness in chlorophyll a concentration in coastal archipelago of Baltic Sea. Frontiers in Marine Science, 7, 563. https://doi.org/10.3389/fmars.2020.00563

Sievänen, T., Pouta, E., & Neuvonen, M. (2007). Recreational home users – Potential clients for coun-

tryside tourism? *Scandinavian Journal of Hospitality and Tourism*, *7*(3), 223–242. https://doi.org/10.1080/15022250701300207

Shaw, M. (2004). Housing and Public Health. *Annual Review of Public Health*, *25*(1), 397–418. https://doi.org/10.1146/annurev.publhealth.25

Smith, M.H., & Smith, G. (2004). Is a house a good investment? *Journal of Financial Planning*, *17*(4), 68–75.

Thomson, H., Thomas, S., Sellstrom, E., & Petticrew, M. (2009). The health impacts of housing improvement: A systematic review of intervention studies from 1887 to 2007. *American Journal of Public Health*, *99*(S3), 681–692. https://doi.org/10.2105/ajph.2008.143909

Ullah, F., & Sepasgozar, S. M. (2020). Key factors influencing purchase or rent decisions in smart real estate investments: A system dynamics approach using online forum thread data. *Sustainability*, *12*(11), 4382. https://doi.org/10.3390/su12114382

Ulrich, R.S, Simons, R.F., Losito, B.D, Fiorito, E., Miles, M.A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*, *11*(3), 201-230. https://doi.org/10.1016/S0272-4944(05)80184-7

Walsh, P., Griffiths, C., Guignet, D., & Klemick, H. (2017). Modeling the property price impact of water quality in 14 Chesapeake Bay counties. *Ecological Economics*, *135*, 103–113. https://doi.org/10.1016/j.ecolecon.2016.12.014

Wei, S.-J., Zhang, X., & Liu, Y. (2017). Home ownership as status competition: Some theory and evidence. *Journal of Development Economics*, 127, 169–186. https://doi.org/10.1016/j.jdeveco.2016.12.001

Wells, N. M., & Evans, G. W. (2003). Nearby nature: A buffer of life stress among rural children. *Environment and Behavior*, *35*(3), 311–330. https://doi.org/10.1177/0013916503035003001

Wheeler, B. W., White, M., Stahl-Timmins, W., & Depledge, M. H. (2012). Does living by the coast improve health and wellbeing? *Health & Place*, *18*(5), 1198–1201. https://doi.org/10.1016/j.healthplace.2012.06.015

White, M. P., Alcock, I., Wheeler, B. W., & Depledge, M. H. (2013). Coastal proximity, health and well-being: Results from a longitudinal panel survey. *Health & Place*, *23*, 97–103. https://doi.org/10.1016/j.healthplace.2013.05.006

White, M. P., Alcock, I., Grellier, J., Wheeler, B. W., Hartig, T., Warber, S. L., Bone, A., Depledge, M.H. & Fleming, L. E. (2019). Spending at least 120 minutes a week in nature is associated with good health and wellbeing. *Scientific Reports*, *9*(1), 7730. https://doi.org/10.1038/s41598-019-44097-3

Wilhelmsson, M. (2008). House price depreciation rates and level of maintenance. *Journal of Housing Economics*, 17(1), 88–101. https://doi.org/10.1016/j.jhe.2007.09.001

Wittowsky, D., Hoekveld, J., Welsch, J., & Steier, M. (2020). Residential housing prices: impact of housing characteristics, accessibility and neighbouring apartments – a case study of Dortmund, Germany. Urban, *Planning and Transport Research*, *8*(1), 44–70. https://doi.org/10.1080/21650020.2019.1704429

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