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Social Utilities versus House Prices as Scales of Residential Preferences for Homes' Attributes 30 Years Apart

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Abstract

One of two scales of residential preferences in a resident's mind is their social and environmental utilities for homes' attributes' levels. The other is their willingness to pay for these attributes' levels as it conforms with prices in the local real estate market. Convergence between two scales of preferences has one mentally superseding the other as primary. Divergence will more likely produce a consumption disequilibrium as the gap in price between affordable socially and monetarily most preferred attributes' levels of homes. Convergences and divergences between these two fluctuating scales of preferences are measured with three interrelated datasets for up to 74 respondents and 3,000 single-detached(-like) houses in each of Saskatoon SK in 1987 and Windsor ON in 2020. Results are that respondents have diverging monetized and social utilities for up to seven of 12 generic attributes of homes in 1987 and/or 2020. They therefore will frequently have large consumption disequilibria for these attributes. The maximum of these will average up to one-half more than the price of an attribute's socially most preferred level if they want its monetarily most preferred level. Despite this, a typical respondent is not behaving as if asset accumulation potentials realized in prices for homes' attributes levels have superseded social needs and desires for up to seven attributes' levels, even at times such as after moving in or when planning on moving out.

Keywords

Residential Mobility, House Price, Preference, Utility, Consumption Disequilibrium

1. Introduction

Most researchers of housing choice speculate about the presence of two possibly

different scales of residential preferences in a resident's mind (Judson, Iyer-Raniga, & Horne, 2014; Phipps, 1987; Yagi, 2018): E.g., "The question of how preferences for housing are formed is not one which troubles housing economists unduly: as in much of mainstream economics housing preferences are treated as innate. Yet ... housing preferences and aspirations are, in part at least, socially determined" (Marsh & Gibb, 2011: p. 223). Preferences in general are retrieved or activated from cognitive values for entities such as homes when making a choice; or they may be constructed or interpolated from other cognitive values at time of choice in unfamiliar environments (Fujishige & Yang, 2012; Warren, McGraw, & Van Boven, 2011). Preferences operate as cognitive orientations towards entities such as homes that a person may or may not be able to exercise in choices; but just because something is preferred does not guarantee it will be chosen (Jansen, 2014). One of two prototypical scales of residential preferences is a resident's social and environmental utilities for homes' attributes' levels. The other is their willingness to pay for these attributes' levels as it conforms with prices in the local real estate market. This study calibrates and compares these two scales with data from 1987 and 2020. Even though the first set of data was collected long ago, this is the first time that two scales of social utilities and prices have been empirically quantified as articulations of residential preferences.

If two scales of preferences have distinct cognitive values for different purposes, times, or places, then observation of one scale or the other may occur if a resident accentuates it when evaluating a home (Fehr & Hoff, 2011; Preece et al., 2020). For example, a resident in a family-oriented household may be more attentive to their home's social and environmental attributes. They may be uncertain about purchasing power for a new home until they interact with actors in the local real estate market. In comparison, an entrepreneurial resident including those recently deciding to move or moving may be more sensitive to the monetary values of their old or new home's attributes. They will more likely know their budget constraint, and they consequently may depreciate their social utilities for an unaffordable home and its attributes' levels.

Some researchers of housing choice however hypothesize that prices of modern homes' attributes' levels have superseded social utilities as representations of residential preferences: E.g., "Households are not autonomous decision-making units and ... behavioural aspects of residential mobility are more realistically explained as a form of adaptive behaviour to the system of housing supply and allocation, which is, of course, dependent on the structure of the wider society" (Short, 1978: p. 442). Or "[t]he movement by owners to more expensive housing seems to be at least as related to a cumulative capital gain in previously owned homes than to any specific needs" (Deurloo, Dieleman, & Clark, 1988: p. 67). Or more recently, "[a]s land and house prices rise faster than incomes over a lengthy period of time, people increasingly view property not just as a place to live but as financial investments: for retirement, for their children, as an asset to

borrow against and/or simply as a speculative financial asset" (Ryan-Collins, Lloyd, & Macfarlane, 2017: p. 110). In short, a resident who nowadays is saturated with the privileging of business in social life, and is egged on by politicians and influencers, may have progressed from maintaining and improving a home's attributes for resale – and onto inflating its potential for asset accumulation such as if needed as collateral for loans for non-housing consumption (Fikse & Aalbers, 2021; Forrest & Hirayama, 2018; Ong et al., 2013; Walks, 2016; Watson, 2009).

In reality, structural forces manifest in changes in house prices may be behind an evolution in social utilities for homes' attributes' levels towards convergence with prices of those attributes' levels (Crawford & McKee, 2018). Different prices may prompt rethought opinions of attributes' levels' usefulness as well as update their affordability within a search price range (Megbolugbe, Marks, & Schwartz, 1991). Indeed, activation of monetized preferences over social preferences in evaluating a home, may suppress a consumption disequilibrium within the budget for housing (Quigley & Weinberg, 1977; Weinberg, Friedman, & Mayo, 1981). A consumption disequilibrium for a home and its attributes is the gap between the prices of the highest-priced monetarily most preferred home or attribute and the socially most preferred home or attribute. Buyer's remorse may be avoided after closing this price-gap and minimizing a consumption disequilibrium by spending more on an affordable highest-priced home than a socially preferred one. On the other hand, heeding this price-gap may help a resident's practical decision if they are persuaded by somebody else or themselves to needlessly acquire higher-priced attributes' levels.

A resident will more likely (or less likely) have a theoretical consumption disequilibrium in the event of a divergence (or convergence) between possibly fluctuating monetary values and social utilities for attributes' levels of homes. Empirically tested therefore are whether utilities representing social preferences for homes' attributes' levels diverge from or converge with prices representing economic preferences for those attributes' levels at a point in time or through time. A resident's economic preferences for these attributes' levels are represented by marginal implicit prices of homes' attributes' levels calculated from a hedonic housing price model of a local real estate market. Corresponding unconstrained social preferences are derived from their like or desirability for homes without nominal constraints on them such as affordability. These unconstrained utility functions are then transformed via a respondent's budget for housing into budget-constrained social utilities.

Empirical comparisons are between prices and social utilities for attributes' levels of conventional single-detached(-like) homes at two times in two far-apart but otherwise similar cities of Saskatoon SK in 1987 and Windsor ON in 2020. Twelve generic attributes have long been hypothesized as popular for residents evaluating these types of homes in mid-sized Canadian cities (Phipps, 1987, 2018; Phipps & Clark, 1988). Attributes are a dwelling unit's type and size, represented by x_1; its house age and exterior finish, x_2; its basement condition and

home renovations, x_3; its lot size and garage, x_4; the neighbourhood's landscaping, x_5; the neighbouring homes' types and repair, x_6; the ages, ethnic group and education, and mobility of the resident's neighbours, x_7, x_8 and x_9, respectively; and the home's accessibilities to work and retail stores, schools, and parks or waterfront, x_{10}, x_{11} and x_{12}, respectively (**Table A1** in **Appendix**). These are not unique Canadian attributes of homes. The same ones may still describe single-detached(-like) homes in Santa Monica CA, USA, and Loughborough LE, UK, with differently worded descriptors for levels of only one of the former's attributes and three of the latter's attributes (Phipps, 1989).

2. Theory of Residential Preference as Utility or Price

Two cognitive scales of value for a home's attributes are clarified if $p_n^t\left(x_{ij}\right)$ defines an n^{th} resident's economic willingness to pay for the j^{th} level of the i^{th} attribute of a home, and $u_n^t\left(x_{ij}\right)$ defines this n^{th} resident's social utility for the attribute's level. One scale is a home's asset-accumulation potential realized in a price (Phipps, 1987; Weinberg, Friedman, & Mayo, 1981). This price in theory is a resident's willingness-to-pay for an attribute's level, but as already mentioned, a resident will revise it to conform with its price after participating in the local real estate market, $p^t\left(x_{ij}\right)$ (Boumeester, 2011). Prices of attributes' levels of the J^{th} home at time t are marginal implicit prices comprising its overall sale price in the local market,

$$p^t\left(X_J\right)=\sum_i w_i \times p^t\left(x_{ij}\right) \tag{1}$$

where w_i is the contribution of each i^{th} attribute's price to overall price in that market, and the overall price may have a nonlinear transformation, such as LN $P^t\left(X_J\right)$ (Des Rosiers, Dubé, & Thériault, 2011; Malpezzi, 2002).

The other cognitive scale for evaluating a home's attributes is in terms of usefulness or social utility (Fishburn, 1970). A resident may formulate their overall social preference for a J^{th} home at time t by aggregating its attributes' levels' utilities after possibly weighting each i^{th} attribute by its $w_{n,i}$ importance for them,

$$u_n^t\left(X_J\right)=\sum_i w_{n,i} \times u_n^t\left(x_{ij}\right) \tag{2}$$

These unconstrained utilities for attributes' levels are transformed into budget-constrained utilities if a resident depreciates unaffordable attributes' levels of homes in the local market. The n^{th} resident has a budget-constrained utility for a j^{th} level of an i^{th} attribute of a home, $u_n^t\left(x_{ij^*}\right)$, if the price of this attribute's level, $p^t\left(x_{ij}\right)$, is within their price range for new homes at time t, $p^t\left(x_{ij^*}\right)$. This represents a cognitive process where the resident who is knowledgeable of prices will assign no utility to unaffordable attributes' levels, or at least lower utility than somebody who can afford them. In other words, a home's attributes are evaluated in terms of unconstrained utilities if prices of attributes' levels are known and affordable,

$$\forall i \text{ if } p_n^t\left(x_{ij}\right) \le p_n^t\left(x_{ij^*}\right), u_n^t\left(x_{ij^*}\right)=u_n^t\left(x_{ij}\right) \tag{3}$$

Otherwise,

$$\text{if } p_n^t\left(x_{ij}\right) > p_n^t\left(x_{ij^*}\right), \lim_{j^*\to 0}\left(u_n^t\left(x_{ij^*}\right)\right) = 0 \tag{4}$$

Values of budget-constrained utilities relative to unconstrained ones depend upon not only the ranges of predicted prices of attributes' levels but also the position of a resident's search price within those ranges. Budget-constrained utilities therefore specify affordable socially and monetarily most preferred attributes' levels so long as they are calculable. Some attributes will have relatively wide ranges of prices for their attributes' levels, such as house type and size, house age and exterior finish, basement condition and home renovations, and lot size and garage (Phipps, 2020). A resident who budgets a search price in the middle range of attributes' levels' prices can afford some but not all attributes' levels. Other attributes, however, will have narrower ranges of prices, such as accessibilities to work and stores, schools, and parks/waterfront in mid-sized cities. A resident will have equivalent budget-constrained utilities as unconstrained utilities if they can afford all attribute's levels. Or, more rarely, they will have incalculable budget-constrained utilities if they cannot afford any attribute's levels.

Budget-constrained utilities for an i^{th} attribute of a home are used to define a resident's consumption disequilibrium for the attribute, $\Delta p_n^t\left(x_{ij^*}\right)$. This is the gap at time t between the prices of their affordable highest-priced monetarily most preferred attribute's level, $p^t\left(x_{im^*}\right)$, and their affordable socially most preferred one, $p^t\left(x_{is^*}\right)$, where $j = s$,

$$\Delta p_n^t\left(x_{ij^*}\right) = p^t\left(x_{im^*}\right) - p^t\left(x_{is^*}\right) \tag{5}$$

One measure of an overall consumption disequilibrium, for example, for a J^{th} home, $\Delta p_n^t\left(X_{J^*}\right)$, is the maximum price-gap for a single attribute,

$$\Delta p_n^t\left(X_{J^*}\right) = \max_{i=1}^{12} \Delta p_n^t\left(x_{ij^*}\right) \tag{6}$$

This partial measure is introduced to emphasize that a resident can in theory afford to spend an amount to eliminate the maximum consumption disequilibrium for an attribute's level. This reaction however will produce the supersession of monetized preferences over social preferences. This is because they are closing a consumption disequilibrium's price-gap by spending more on an affordable socially less preferred attribute's level.

Another fuller measure of overall consumption disequilibrium is the cumulation of all attributes' levels' differences in prices at a particular time,

$$\Delta p_n^t\left(X_{J^*}\right) = \sum_{i=1}^{12} \Delta p_n^t\left(x_{ij^*}\right) \tag{7}$$

A resident may have no consumption disequilibrium for attributes whose prices habitually converge with social utilities, such as those describing areas of neighbouring lots, volumes of trees in a neighbourhood's landscaping, and distances to workplaces and stores, schools, and parks or riverbank. More (or less) of these attributes' quantities will be not only intrinsically preferred but also

higher priced. Alternatively, reasons for differences in prices between a resident's socially and monetarily most preferred attributes' levels may be social – such as for livable house types and sizes, serviceable house ages and exterior finishes, or neighbours from age cohorts or (dis-)similar ethnic group(s) as opposed to occupants of most expensive homes. Or economic, for a little rather than a lot of basement finishing and home renovation by previous residents. Or environmental, for no nearby high-rise apartment and condominium buildings and their mobile residents.

Moreover, revised or interpolated social utilities for these attributes' levels from one time to the next may coincidentally diverge from or converge with prices of the same attributes' levels in the local real estate market (Phipps, 2021). A more dynamic consumption disequilibrium, $\Delta p_n^{t\to t+1}\left(X_{J^*}\right)$, will assimilate these changes from fluctuations in attributes' levels and a resident's social utilities and prices for them between times t and $t+1$. A resident's changing social values for liked and disliked homes' attributes may stem, for example, from their reactions to trends and superimposed fluctuations in prices of homes' attributes, such as caused by (dis-)improvements of homes or occurrences of events inside their neighbourhood. Their reactions to price changes after home (dis-)improvements may especially contribute to the convergence or divergence of utilities and prices of attributes' levels of house type and size, and basement condition and home renovations. These are dwelling units in which central air conditioning is installed, one or more bedrooms or bathrooms are added, or a full basement is finished. Changes in four dwelling-unit attributes between times of sale and resale of sizable minorities of sold homes in two inner-city neighbourhoods in Windsor ON, have doubled or tripled their respective predicted average 6% or 5% increase in price solely with the passage of time (Phipps, 2020).

A resident may furthermore react to changes in prices of homes' attributes after occurrences of local events from people's adjustments inside or outside a neighbourhood such as to declining employment or housing affordability, and a recessionary state of the economy or not (Ding & Knaap, 2002; Wang, 2018). Significant percentage decreases in house prices occurred in one Windsor inner-city neighbourhood during 1982, 1990, 2008 and 2011, and in another during 1990 and 2008, which were years of economic recession in Canada except for 2011 (Phipps, 2020). A subsequent slow decline from a highest annual unemployment rate prolonged the 2007-09 great recession's depreciated house prices until 2011 in both neighbourhoods. All in all, prices of homes' attributes' levels through time may converge with or diverge from unconstrained and budget-constrained utilities for those attributes' levels. Secondly, these convergences and divergences for attributes' levels may be different for residents who are recent movers or thinking of moving.

3. Prices, Utilities, and Respondents' Data

Differences between consumption disequilibria and social utilities and prices for

homes' attributes' levels are tested with three interrelated datasets collected in two mid-sized Canadian cities of Saskatoon SK in 1987 and Windsor ON in 2020. The first dataset has marginal sale prices of attributes' levels of approximately 3000 single-detached(-like) homes in each city. The second dataset includes up to 74 respondents' social utilities for the same attributes' levels in each city. The third dataset has additional data about personal characteristics of respondents and their price ranges for homes if they looked for one tomorrow, and their knowledge of the local housing market. Subsections elaborate on summaries of three datasets in two published articles (Phipps, 2020, 2021).

3.1. Homes' Attributes' Marginal Prices

Marginal prices of attributes' levels of single-detached(-like) homes in Saskatoon in 1987 and Windsor in 2020 are computed with regression coefficients of a hedonic housing price model for each city (Phipps, 1987, 2020). Saskatoon's hedonic housing price model has data for 2702 single-family homes listed in Multiple Listing Service (MLS) catalogues as being for sale in sample weeks in each spring and fall from fall of 1980 to spring of 1986. Neighbourhood data from the city's 1981 census tract (CT) data for each sampled home's location are merged with its MLS data. Windsor's hedonic housing price model has data for all 2920 inhabitable single-detached, duplex and row houses sold through the MLS in two inner-city neighbourhoods in the city. These data are from the beginning of January 1981 in one neighbourhood named Glengarry, and from January 1986 in another named Wellington-Crawford, until the end of December 2018 in each neighbourhood. Merged neighbourhood data are from the 2001, 2006, 2011 or 2016 national census closest to a home's time of sale or resale in one of 25 dissemination areas (DAs) covering the two neighbourhoods. The year 2001 was the first for subdivision of Canadian census metropolitan areas such as Windsor ON into DAs with the small-area data (Statistics Canada, 2016). Larger CTs have not only different boundaries but also different variables than DAs. A dissemination area in this part of metropolitan Windsor has mostly rectangular shape; an approximately one-half kilometre by one-quarter kilometre area; and boundaries aligned with a grid street pattern.

Each regression model includes independent variables representing 12 generic attributes' levels of single-detached(-like) homes (**Table A1**). Six attributes' levels constructed from MLS and census data in the city of Saskatoon and inner-city Windsor almost exactly correspond with those in experiments for eliciting social utilities (in the next subsection): These are displayed attributes' levels of house type and size, age of construction (and exterior finish), basement condition and renovations, lot size (and garage), landscaping, and neighbours' mobility. (Windsor's possible supplementary name of an attribute is in parentheses.) For example, each attribute's level of house type and size is represented by the combination of three or four house styles, and number of bedrooms (and number of bathrooms in Windsor and floorspace in Saskatoon). Slight differ-

ences in each city, in addition to the local wording of house age and exterior finish, and basement condition and home renovations, are: More detail about renovations in Saskatoon versus a realtor's summary condition of house in Windsor plus the presence of central air conditioning; and in Windsor, a house's exterior finish in brick or stucco or vinyl siding, presence of a garage(s), and neighbourhood identifier as a landscaping surrogate.

Correspondences are more approximate in a second group of five attributes of neighbouring home types (and repair), neighbours' ages, ethnic group and education, and accessibilities to schools and parks in Saskatoon or riverbank in Windsor. The first three attributes depend on proportional data for a small-sized dissemination area (DA) or a large census tract (CT) applying to a home's local neighbourhood. For example, neighbours' ethnic group and education is represented by median adult income of residents in a CT or DA, and proportions of them who are blue collar or professional workers, university-educated, and visible minorities. Two accessibility attributes are coded near in Saskatoon if located within a same census tract as a school or park; they have observed distances in Windsor. The last and least corresponding attribute of work and stores accessibility is represented by inverse distance to downtown Windsor in kilometres for homes in two relatively compact inner-city neighbourhoods; and by direct distances for near to and far from major workplaces and stores in Saskatoon.

Neither multiple regression is the most parsimonious model, owing to entry of independent variables for calculating marginal prices of attributes' levels. Each has R-squared of 75%; and seven of 23 independent variables representing attributes' levels in Saskatoon and nine of 30 in Windsor have statistically insignificant coefficients (above 5% significance level). Both also have annual or seasonal dummy variables for time of sale or resale of homes. No matter how generalizable their multiple regression coefficients are for house prices elsewhere, their calculated marginal prices with remaining variables' mean values are those of single-detached(-like) homes in two mid-sized Canadian cities at the end of 1986 or 2018 (Sirmans, Macpherson, & Zietz, 2005).

3.2. Computer Interactive Measurement of Preferences

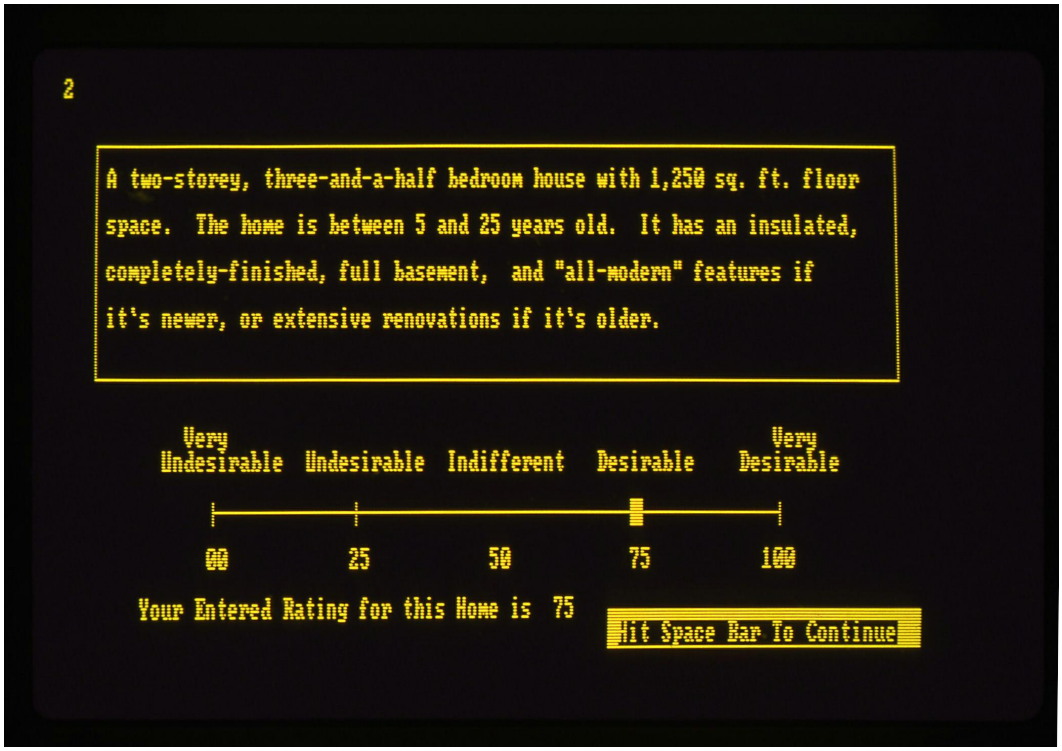
Respondents' analyzed social preferences for attributes' levels of single-detached (-like) homes in Saskatoon SK and Windsor ON were measured in two similar conjoint choice experiments in late-1986 and early-1987 in the former, and late-2019 and early-2020 in the latter (Knight & Menchik, 1976). The experiment for eliciting residential preferences in Saskatoon is the first stage in a human-computer simulation game of the residential choice process. A respondent "played" the simulation game at home on an IBM portable personal computer, with an experimenter present for one hour or longer. The simulation game was computer-programmed from scratch; so too was the online surveying project for eliciting residential preferences in Windsor via the internet. The simulation game ran on an extraordinary high-tech device at the time, but its displays may now appear

primitive and cumbersome (Figure 1), in comparison with the online surveying project's glossy and fast-rendering webpages (Figure 2). A respondent in this more recent online surveying project budgeted up to one-half hour for browsing webpages in a modern internet browser, and without assistance of or motivation from an experimenter. Webpages were browsed wherever and whenever desired by a respondent on a computer or smartphone with high-speed internet connection.

Three phases of the interactive algorithm have the same design in both experiments. First, a respondent is presented with descriptions of homes and neighbourhoods (Keeney & Sicherman, 1976). These descriptions are a subset of all possible combinations of three attributes' levels, and the task is to rate their desirability. Second, preference ratings for these descriptions are then decomposed into their component social utilities for attributes' levels, and possible importance weights by means of a conjoint scaling program in the simulation game, or multiple linear regression functions in the online surveying project. Finally, the respondent reinspects the calculated utilities for attributes' levels, and mentally or physically adjusts them.

3.3. Stage 1 Displays and Data

Descriptions of dwelling units, neighbourhoods, and so on, are formed as hypothetical but realistically available combinations of the previously described levels of different sets of three attributes (Table A1). A respondent in the first stage of



Source: Author screenshot of display on IBM portable personal computer.

Figure 1. Desirability rating of a dwelling unit in the simulation game.

Source: Author screenshot of display in online surveying project.

Figure 2. Like or dislike of a home in the online surveying project.

the simulation game indicates their desirability for eighteen combinations of these attributes' levels describing dwelling units, fifteen neighbourhoods, twelve neighbours' compositions, and ten accessibilities to work, schools and other facilities. A respondent in the online surveying project rates their like or dislike for 12 similarly composed homes. Each home is represented in a first screen or tabbed display by levels of three attributes of the dwelling unit; in a second screen or tabbed display by three attributes' levels of the neighbourhood environment; and so on for three attributes' levels of the neighbours and three of the home's accessibilities (**Table A1**). Combinations of attributes' levels for homes are programmed as realistic ones but comprehensive ones; and homes are displayed in random order.

A cosmetic difference between the simulation game and the online surveying project is the latter's automatic slideshow of stock photographs portraying idealized attributes' levels of each displayed home. A more substantive difference is slightly different displayed attributes' levels of local environments between the 1987 and 2020 experiments, including the replacement of the attribute of access to a park with the more salient access to the riverbank in Windsor's study neighbourhoods. Another substantive difference is in the subsequent scales of measured utilities. A Saskatoon home's desirability is rated on a line-scale (**Figure 1**); a Windsor home is rated with between zero and five stars, at half-star increments with labels of totally (dis-)like it, very much (dis-)like it, quite (dis-)like it, somewhat (dis-)like it, and neither like nor dislike it (**Figure 2**). A respondent in the simulation game rated the desirability of each description by moving the cursor along a continuous 0-to-100 line-scale. This line-scale design was used consistently throughout the simulation game, with different labels depending on the question. Ratings' data from the experiments will especially be the comparable when a respondent utilized five labelled points on the line-scales.

3.4. Calculated Utilities for Homes' Attributes

A respondent's utilities for attributes' levels of homes are calculated from their overall ratings of displayed homes during each experiment. Their conjoint rating data in the simulation game were decomposed by a compiled redimensioned version of the non-metric WADDALS conjoint scaling program, written in Fortran for originally executing on a mainframe computer (Takane, Young, & de Leeuw, 1980). The experimenter's presence helped to divert attention from the program's delayed turnaround time for calculating utilities from ratings on the portable PC. Under the assumption no delay is tolerated in an online survey, a respondent's conjoint rating data in the online surveying project were analyzed with three functional procedures written in JavaScript for calculating intercept and slope coefficients of a multiple linear regression (Rosetta Code, 2020). While using dummy independent variables for attributes' displayed levels, in conjunction with initial regression coefficients resembling those at the end of the simulation game, utilities were iteratively calculated for predicting the like or dislike

of each displayed home. This prediction was instantaneously displayed beside the observed like or dislike of it. A respondent's regression coefficients in subsequent calculations are computed after their rating of the final displayed home.

Coincidentally, the answer of approximately three-quarters of 69 Windsor-respondents to a question in the online surveying project was for similar predicted and observed likes and dislikes of homes; 17% answered with inaccurate predictions; and 3%, either too low or too high predictions. In fact, observed likes or dislikes of displayed homes are quite well predicted by utilities for attributes of the dwelling unit, neighbourhood environment, neighbours, or accessibilities calculated from multiple regression coefficients: Simple correlations average more than 0.87 between respondents' observed and predicted values. In comparison, "weak" predictions of Saskatoon-respondents' corresponding utilities are gauged by a less interpretable stress index for the WADDALS program (Phipps & Clark, 1988: p. 257).

3.5. Stage 2 Situational Variables

Stage 2 of the simulation game and the online surveying project is a computer questionnaire to elicit a respondent's name, address, gender, owner or renter tenure, and household's situational variables including the occupation(s) of primary wage earner(s), household's length of residence in its current home, age composition of household's members, and search price range for a new home "if started looking tomorrow". A differently worded question about likelihood of moving is whether thinking of moving in Saskatoon, or whether may be or certainly moving in the next two years in Windsor. A further question in the online surveying project is about a respondent's knowledge of the housing market if they or a neighbour listed a house or property for sale in the past two years.

The second stage of the online surveying project and the simulation game ended with a respondent optionally inspecting the calculated utility function for each attribute in the former, and possibly adjusting the utilities for the levels recovered by WADDALS in the latter. Utilities in the online surveying project could be inspected as points on static curves prior to signing out of the project. Plotted points on an interactive graph in the simulation game could be interactively adjusted up or down for higher or lower utility than originally scaled for an attribute's level. The online surveying project did not risk fatiguing respondents with adjustments of their utilities; it instead gained consent for transmitting all locally stored data to the researcher. Research ethics approval stipulated this consent, and no data are transmitted from local storage on a respondent's device until the end of the second stage. The simulation game's locally stored data are retained on the portable PC for subsequent analysis.

3.6. Respondents

Seventy Saskatoon respondents were recruited by means of 280 letters of invitation to newly listed owner-occupants in the annual city directory. Almost all re-

spondents are owner-occupiers; most are less than 40 years old, with live-in children; more have managerial or professional occupations; and more lived less than two years at their current address and/or are thinking of moving (Table 1). These respondents resemble members of mature traditional affluent families who recently moved into or might be moving out of the current owned home, though their representativeness of movers or other households was not statistically established at the time. Meanwhile, up to 74 Windsor respondents and their households have statistically representative personal characteristics of all residents of dissemination areas encompassing Windsor's four inner-city neighbourhoods of Glengarry, Wellington-Crawford, University, and Sandwich (GWCUS), and surrounding areas in the most recent national census of 2016 (Table 1). Residents were targeted as living in these four neighbourhoods, where Canada Post three-times delivered 5000 recruitment flyers to single-detached houses, duplexes, and row houses.

In general, equal numbers of respondents in Windsor are self-identified men or women, whereas almost two-thirds of them are women in Saskatoon. Otherwise, Windsorites most frequently are aged less than 40 years old; they are either in cohabiting partnerships or unattached individuals; and the occupation(s) of their primary wage earner(s) is(are) managerial or professional, retired, student, or administrative professional or office worker. Almost one-half versus two-thirds in Saskatoon lived for less than two years in the current home and/or (may be or certainly moving during the next two years) [or are thinking of moving]. (Wording of response is in parentheses for Windsor, and square brackets for Saskatoon.) Most Windsor respondents however have a familiarity with the local housing market, as more than two-thirds knew a neighbour who listed a house or property for sale during the past two years, or did this themselves (Table 1). Note these are responses to a question in the second stage of the online surveying project about whether they or any of their neighbours had listed a house or property for sale during the past 2 years.

Sampled Saskatonians and Windsorites with mostly similar personal and household characteristics arguably represent members of a paired sample as credibly as possible so far apart in time. Saskatoon SK and Windsor ON were similar mid-sized cities during the late 1980s, even though they are 2500 km apart. They each had a population of approximately 190,000 (not including Windsor's surrounding half-as-large-again metropolitan area). Their economies were dominated by blue-collar private sector jobs in resource extraction of potash and agricultural processing in Saskatoon and automotive manufacturing and assembly in Windsor, and white-collar public sector jobs in a university and hospitals in both. Their affordable house sale prices in 1986 predicted by the hedonic housing price models have examples of approximately $54,000 in the city of Saskatoon, and $36,000 in inner-city Windsor for a three-bedroom bungalow with all other average dwelling unit, neighbourhood and accessibility characteristics. Both Saskatoon and Windsor were classified as affordable places to live in Canada during the 1980s; and Windsor was still in that class in late-2019

Table 1. Summary characteristics of samples of residents.

Characteristic	Response[a]	1987 Saskatoon Respondents		2020 Windsor Respondents[b]		Comparison[c]	2016 GWCUS DAs
Gender	Male	26	37%	36	49%	=	52%
	Female or other	44	63%	37	51%	=	48%
	Total	70		73			
Ages	[15 years old and younger] (Children at home)	49	70%	23	34%		
	Less than [36](40) years old	38	54%	40	60%	=	49%
	Total	70		67			
Relationship between adult members of household	Unattached individual or cohabitant with other unattached individuals			23	34%	-	66%
	Family with live-in children	49	70%	20	30%		43%
	Cohabiting partnership			17	25%	=	34%
	Total	70		67			
Owner or renter of current home	Owner	60	86%	46	65%	+	26%
	Total	70		71			
Length of current residence	Less than two years	31	44%	16	22%		
	Total	70		73			
Likelihood of moving	[Thinking of moving] (May be or certainly will be moving during the next 2 years)	36	51%	24	33%		
	Total	70		73			
Occupations of wage-earners in household[d]	Managerial or professional	37	53%	23	33%	=	24%
	Retired			18	22%	+	7%
	Student			10	12%	=	7%
	Administrative professional or office worker	17	24%	9	11%	=	14%
	Total	70		82			
Price range for new home if started looking tomorrow	Up to [$90,000] ($200,000)	37	53%	27	45%		
	More than [$90,000] ($200,000)	33	47%	33	55%		
	Total	70		60			
Knowledge of housing market	I don't know anybody who listed their house or property for sale			20	29%		
	I listed and/or I know a neighbour who listed their house or property for sale during the past two years			49	71%		
	Total			69			

[a]Windsor's possible new wording for a survey response is in parentheses, and Saskatoon's possible alternate wording is in square brackets. [b]Windsor respondents may total less than full sample of 74, due to missing data for a response. [c]In a comparison between a Windsor sample proportion and a GWCUS DAs population proportion: an equals sign indicates the sample proportion is not significantly different from the population proportion, as the latter is between the lower and upper bounds of the 95% confidence interval of the sample proportion. A plus sign indicates the sample proportion is significantly greater than the population proportion as the latter is below the 95% CI's lower bound; and a negative sign, less than the population proportion as the latter is above the 95% CI's upper bound. [d]Total includes multiple wage-earners in some households.

and early-2020, whereas Saskatoon was less so.

4. Empirical Comparisons of Utilities and Prices as Scales of Preferences

Saskatonians' mean unconstrained utilities for homes' attributes' levels are calculated for 70 respondents in 1987 who have no missing data. Some Windsorites have missing data in the absence of an experimenter for assistance and motivation in the online surveying project. Their mean unconstrained utilities are calculated for 71 respondents permutated from 68 with no missing data for the dwelling unit, 54 for each of the neighbourhood environment and the neighbours, and 57 for accessibilities (Table A1). Prices of attributes' levels are constraining for most respondents' residential preferences. Only six Saskatonians in 1987 indicated a search price below the lowest marginal implicit price of $62,224 for an attribute's level of neighbours' ethnic group and education; but 17 had a search price above the highest marginal implicit price of $108,834 for an attribute's level of house type and size. Similarly, eight Windsorites in 2020 were below the lowest marginal implicit price of $100,811 for an attribute's level of access to the Detroit riverbank; but 18 were above the highest marginal implicit price of $288,761 for an attribute's level of basement condition and home renovations. Nine Windsorites did not indicate a search price, plus additional respondents have missing values for varying attributes' utilities. Mean budget-constrained utilities are calculated for up to 64 Saskatonians and up to 50 Windsorites who indicate a search price for a new home and have a budget-constrained utility for at least one attribute's level.

Overall consumption disequilibria, calculated with budget-constrained utilities, cumulate for a typical respondent to $23,061 in Saskatoon in 1987 and $150,112 in Windsor in 2020 (Table A1). These average cumulative amounts are approximately twice the size of the average maximum difference in price between a single attribute's monetarily and socially most preferred levels, at $10,465 in 1987 and $73,330 in 2020. In other words, a typical respondent could afford to spend in 1987 up to one-sixth more, and in 2020 up to one-half more than on their affordable socially most preferred attribute's level if wanting their affordable highest-priced level of that attribute. Note that Windsorites' consumption disequilibria as prices or percentages of prices of attributes' levels are on average four-or-more-times larger than those of Saskatonians. This average four-times difference is after allowing for approximately two Canadian dollars and 20 cents for owned shelter in 2020 worth one dollar in 1987 (Statistics Canada, 2019). This nationwide inflation better describes the difference between observed houses' average predicted prices of approximately $167,000 in Windsor and $74,000 in Saskatoon.

Overall consumption disequilibria are especially cumulations of the price-gaps between up to seven attributes' divergent most preferred levels in 1987 or 2020. Simple correlations classify patterns of dissimilarities between mean utilities and

prices for up to the five levels of four attributes in Saskatoon in 1987, and two of these four attributes and three different ones in Windsor in 2020 (Table 2). In addition to attributes' levels of house type and size and neighbouring home types (and repair) in both cities, the former includes attributes' levels of neighbours' ages and mobility. In Windsor, they include attributes' levels of house age and (exterior finish), basement condition and home renovations, and neighbours' ethnic group and education. Seven attributes' levels have diverging imperfect-positively correlated or negatively correlated preference scales in one or both years. Their levels coincidentally are described with more subjective values than an explicit area, volume, or distance of five remaining attributes. These five have the hypothesized strong positive correlations between mean predicted prices and unconstrained or budget-constrained utilities.

Mean predicted prices and mean utilities for attributes' levels are also visually compared for describing (dis-)similarities if Saskatonians and Windsorites represent each other through time. The primary vertical Y-axis of a graph displays mean unconstrained utilities (as red solid lines for 1987, and blue ones for 2020) and budget-constrained utilities (as orange solid lines in 1987, and purple ones in 2020) with their 95% confidence intervals (as same-coloured above and below dashes) for an attribute's levels. This axis is elongated for different scales of measured utilities in two cities' experiments. The single horizontal X-axis has levels of an attribute in Windsor, with its possible new wording there in parentheses, and

Table 2. Correlations of mean unconstrained (UC) and budget-constrained (BC) utilities and prices of attributes' levels.

Attribute[a]	1987 Saskatoon		2020 Windsor	
	Mean UC Utility and House Price Correlation	Mean BC Utility and House Price Correlation	Mean UC Utility and House Price Correlation	Mean BC Utility and House Price Correlation
House Type and Size	0.77	0.90	0.13	0.65
House Age (and Exterior Finish)	0.95	0.99	0.79	0.42
Basement Condition and Home Renovations	0.99	1.00	0.81	0.79
Lot size (and Garage)	0.94	0.96	0.93	0.96
Landscaping	0.78	0.76	0.95	0.90
Neighbouring Home Types (and Repair)	−0.88	−0.89	−0.02	−0.04
Ages of Neighbours	−0.30	−0.32	0.98	0.93
Ethnic Group and Education of Neighbours	0.80	0.81	0.48	0.36
Mobility of Neighbours	−1.00	−1.00	0.96	0.97
Stores and Work Access	0.98	0.98	0.99	0.97
Schools Access	0.96	0.96	0.99	0.98
(Riverbank) [or Parks] Access	1.00	1.00	0.97	0.99

[a]Windsor's possible supplementary name of an attribute is in parentheses, and Saskatoon's possible alternate name is in square brackets.

Saskatoon's possible former wording in square brackets. The secondary Y-axis has mean predicted prices (as green dashed lines) from a hedonic housing price model for an attribute's levels in each city.

4.1. Divergent Preference Scales of Utilities and Prices for Seven Homes' Attributes

Respondents in both Saskatoon and Windsor have diverging mean unconstrained utilities and predicted prices for two attributes' levels in 1987 and 2020, owing to the imperfectly correlated utilities and prices in each year (Table 2). The first of two attributes is house type and size. Mean unconstrained utilities are highest for a much cheaper two-storey house with four bedrooms, and not for a highest-priced largest two-and-a-half storey house with four-and-a-half bedrooms (Figure 3). Consequently, those having the two-storey house with four bedrooms as their budget-constrained most preferred attribute's level are predicted to have a moderate consumption disequilibrium averaging $4753 in Saskatoon and a larger one of $26,202 in Windsor (Table A1). These sizable average amounts, representing 5% and 13% of the attribute's level's price in each respective city, are predicted additional expenditures for respondents' upgrading to their affordable highest-priced house type and size.

In comparison, Saskatonians have negatively correlated mean unconstrained or budget-constrained utilities and mean predicted prices for attributes' levels of neighbouring home types (and repair) in 1987; and Windsorites have uncorrelated

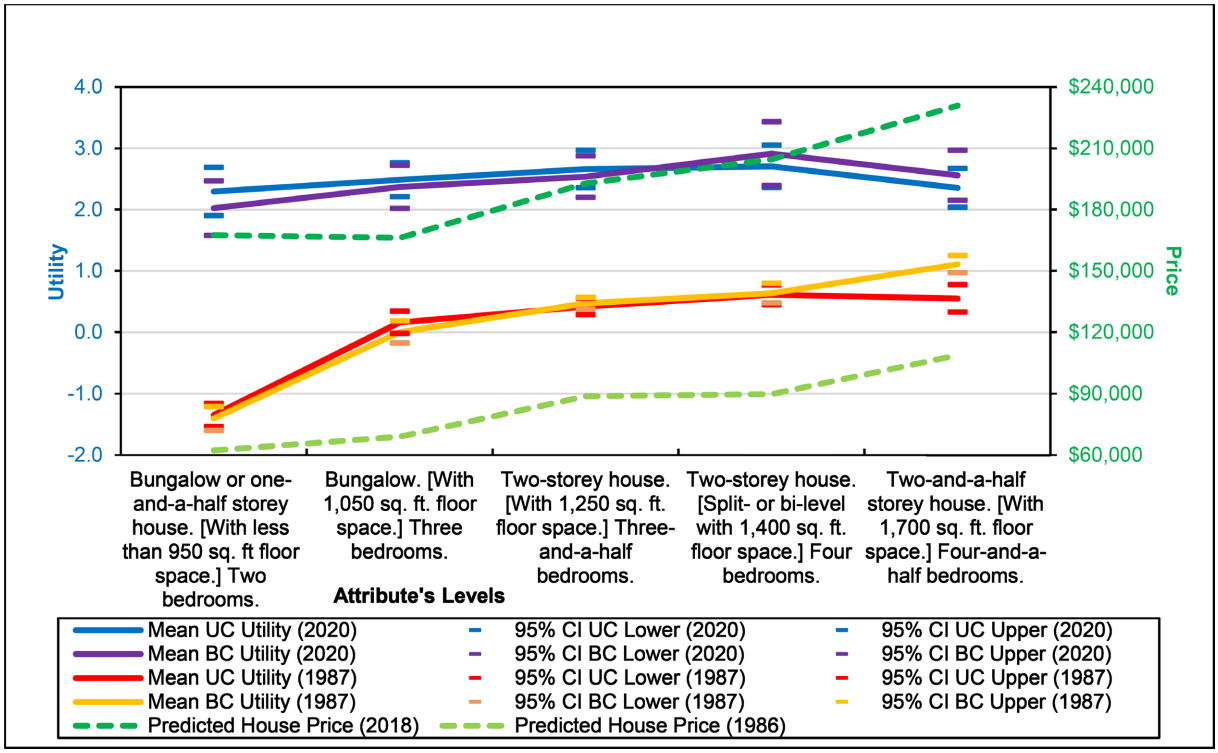


Figure 3. House type and size unconstrained (UC) and budget-constrained (BC) mean utility functions and 95% confidence intervals (CI) lower and upper bounds, and predicted house price functions in 1987 and 2020.

ones in 2020. (Windsor attribute's supplementary name is in parentheses.) They moderately depreciate the higher-priced neighbouring homes including the highest- or next-to-highest-priced nearby high-rise rented-apartment or owned-condominium buildings (and no houses in need of major repair) in their socially most preferred neighbourhood (Figure 4). Higher homes' prices where there are higher numbers of neighbouring high-rise homes or moving neighbours, such as in Saskatoon's core neighbourhoods during the 1970s, may persist after unpreferable redevelopment in the neighbourhood (Evenson & Cancelli, 2018). Consequently, majorities of respondents will have average consumption disequilibria of $7098 and $8948 if they have highest mean utilities for the lowest- or next-to-lowest-priced neighbouring homes of almost all single-detached houses with owner-occupiers (and no houses in need of major repair) (Table A1). The former average additional expenditure in 1987 is exceptional for upgrading to the affordable highest-priced neighbouring home type and repair: It is almost equivalent to that in 2020 without deflation, and it is a higher 10% than 6% of this attribute's level's price.

Somewhat differently, socially most preferred attributes' levels of neighbours' ages and especially neighbours' mobility are monetarily most preferred ones in 2020, after not being this in 1987. Mean predicted prices and unconstrained or budget-constrained utilities for two attributes' levels are almost perfectly correlated in 2020, but negatively correlated in 1987. Saskatonians' least preferred though highest-priced neighbouring homes have lots of movers each year, whereas they most preferred the lowest-priced homes with few neighbours who move each year (Figure 5). This most preferred attribute's level will however only produce

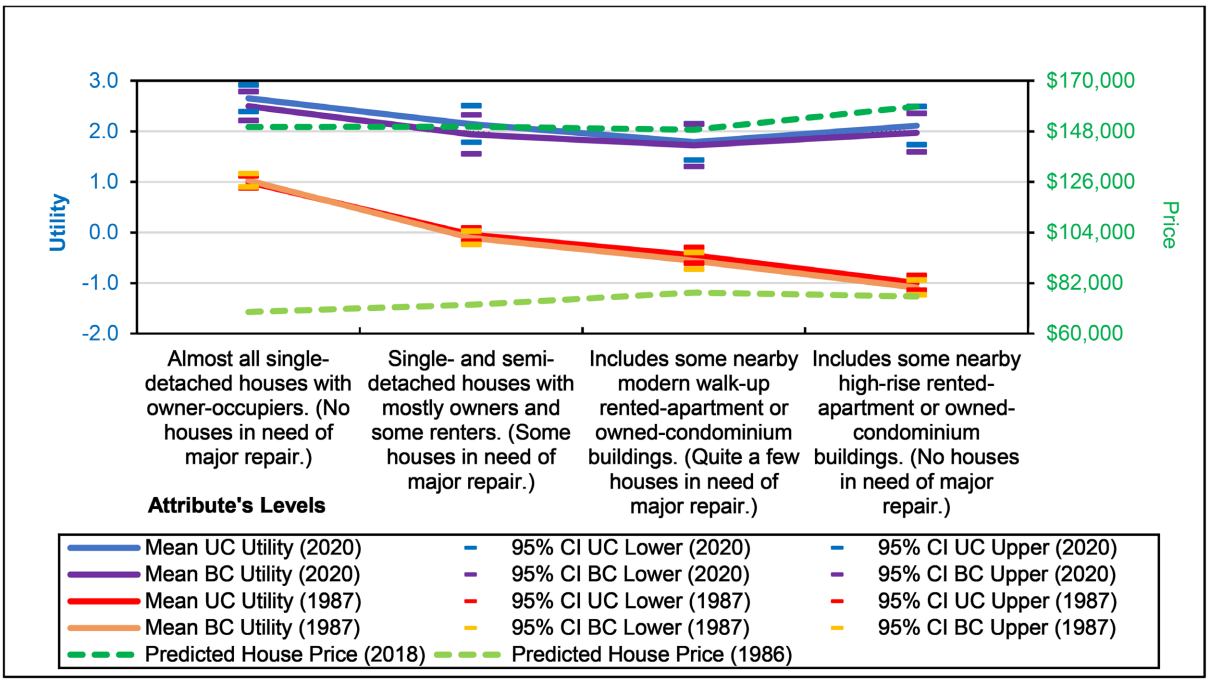


Figure 4. Neighbouring home types and repair unconstrained (UC) and budget-constrained (BC) mean utility functions and 95% confidence intervals (CI) lower and upper bounds, and predicted house price functions in 1987 and 2020.

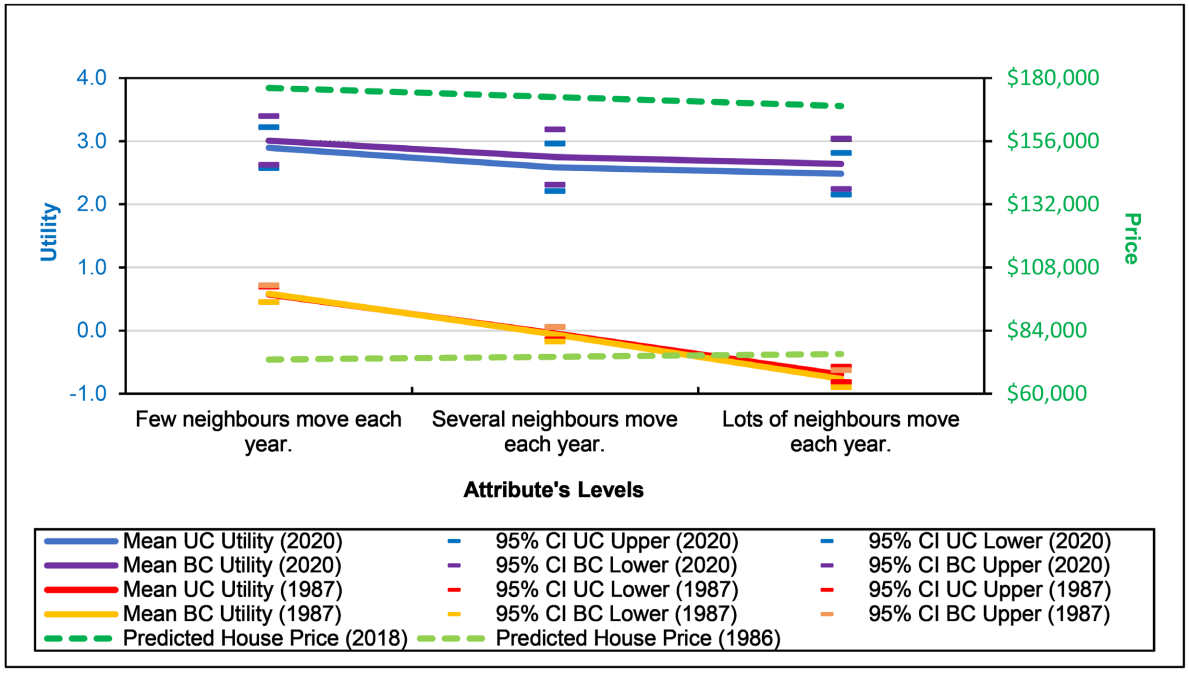


Figure 5. Mobility of neighbours unconstrained (UC) and budget-constrained (BC) mean utility functions and 95% confidence intervals (CI) lower and upper bounds, and predicted house price functions in 1987 and 2020.

a small average consumption disequilibrium of approximately $2020 or 3% of its price for them.

Similarly, Saskatonians will have a small average consumption disequilibrium of $1341 or 2% of the price if their highest mean utilities are for neighbouring homes occupied by middle-aged residents with elementary school-aged children at home. Their lowest mean utilities are for the next-to-highest-priced attribute's level of neighbouring homes occupied by middle-aged residents with teenaged children at home (**Figure 6**). Long since forgotten is how teenagers could be out and about at all hours of the day and night during the mid-1980s before modern video games began being played inside the home. Presently, Windsorites who may be or certainly moving during the next two years have highest mean budget-constrained utility for middle-aged neighbours with teenaged children at home; and this is their sole difference with respondents who are not moving.

Meanwhile, Windsorites' socially most preferred attributes' levels are not their monetarily most preferred ones for three attributes' levels. First, they depreciate higher-priced basement finishing and renovations by previous residents in their socially most preferred home (**Figure 7**). Indeed, their socially most preferred unfinished or partly finished full basement, or insulated completely finished full basement, and some modern features or renovations is predicted on average to produce a quite large consumption disequilibrium of $42,654 or 22% of the former's price for them, and an even larger one of $84,255 or 41% of the latter's price. Second, and similarly to Saskatonians, they appreciate neighbouring homes occupied by diverse neighbours who probably like themselves have young children, and who are not moving. Their mean unconstrained and budget-constrained utilities

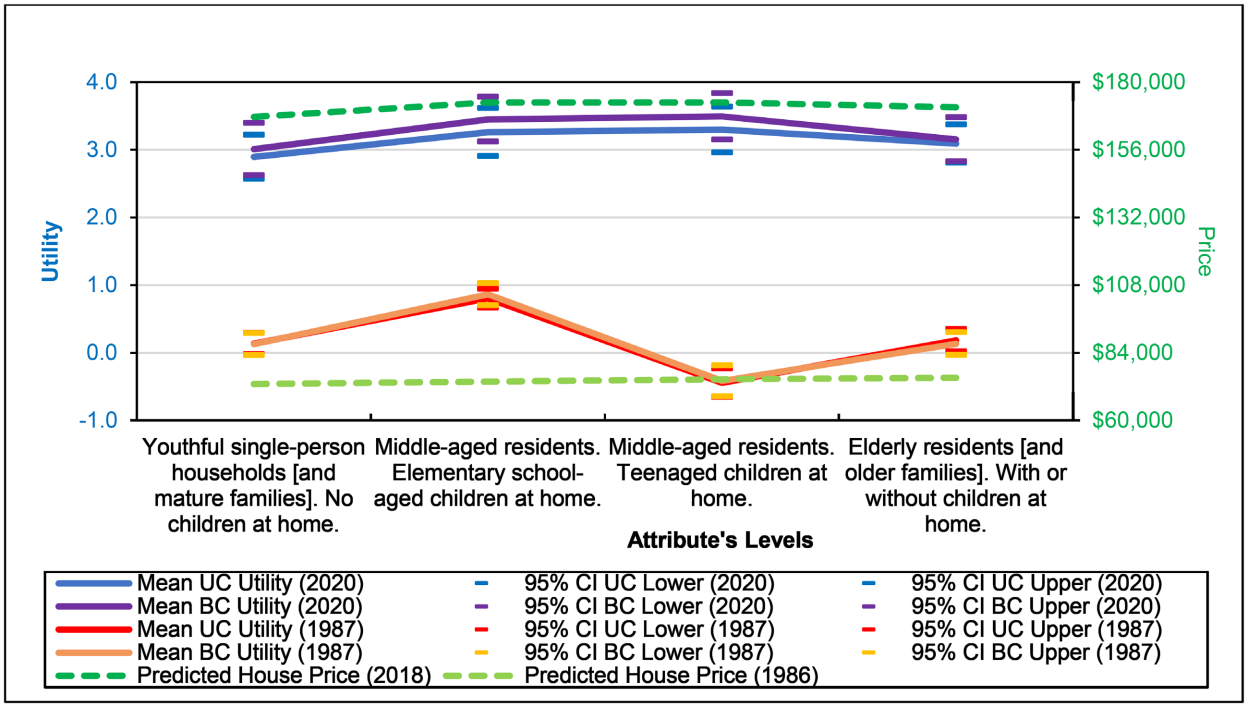


Figure 6. Ages of neighbours unconstrained (UC) and budget-constrained (BC) mean utility functions and 95% confidence intervals (CI) lower and upper bounds, and predicted house price functions in 1987 and 2020.

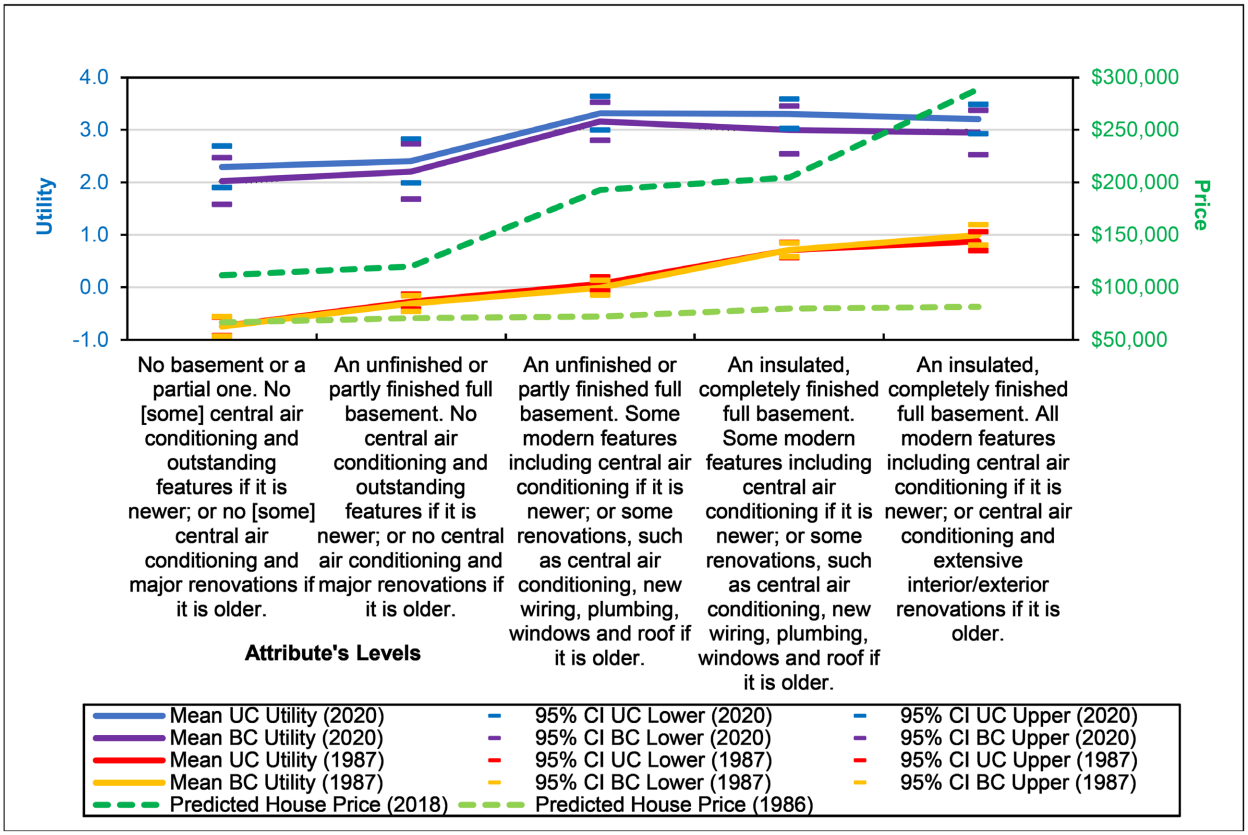


Figure 7. Basement condition and home renovations unconstrained (UC) and budget-constrained (BC) mean utility functions and 95% confidence intervals (CI) lower and upper bounds, and predicted house price functions in 1987 and 2020.

are marginally highest for neighbouring homes occupied by skilled and white-collar workers with high-school or technical-college education from either same or different ethnic group as them (Figure 8). They will have a moderate average consumption disequilibrium up to $13,657 or 8% of the price for these preferable neighbours. These are possibly in comparison with higher-priced neighbouring homes occupied by professional workers with university or college degree from same ethnic group as them.

Last, Windsorites' mean predicted prices and unconstrained or budget-constrained utilities for attribute's levels of house age (and exterior finish) are more weakly correlated in 2020 than those of Saskatonians in 1987 (Figure 9). Interestingly, a highest mean budget-constrained utility for a house less than 5 years old with brick or stucco exterior finish is the sole interpretable difference between Windsor respondents who lived for less than two years in the current home, and the majority who lived there longer and most preferred the lowest-priced house more than 30 years old with the same finish. The latter most preferred attribute's level also incurs a large consumption disequilibrium of $24,917 or 13% of its price.

4.2. Convergent Preference Scales of Utilities and Prices for Five Homes' Attributes

In contrast with the foregoing seven attributes, a home composed of socially most preferred levels of five remaining attributes' areas, volumes, or distances also has the highest-priced levels in both 1987 and 2020, and thus it will produce no consumption disequilibrium (Table A1). This most preferred home, for

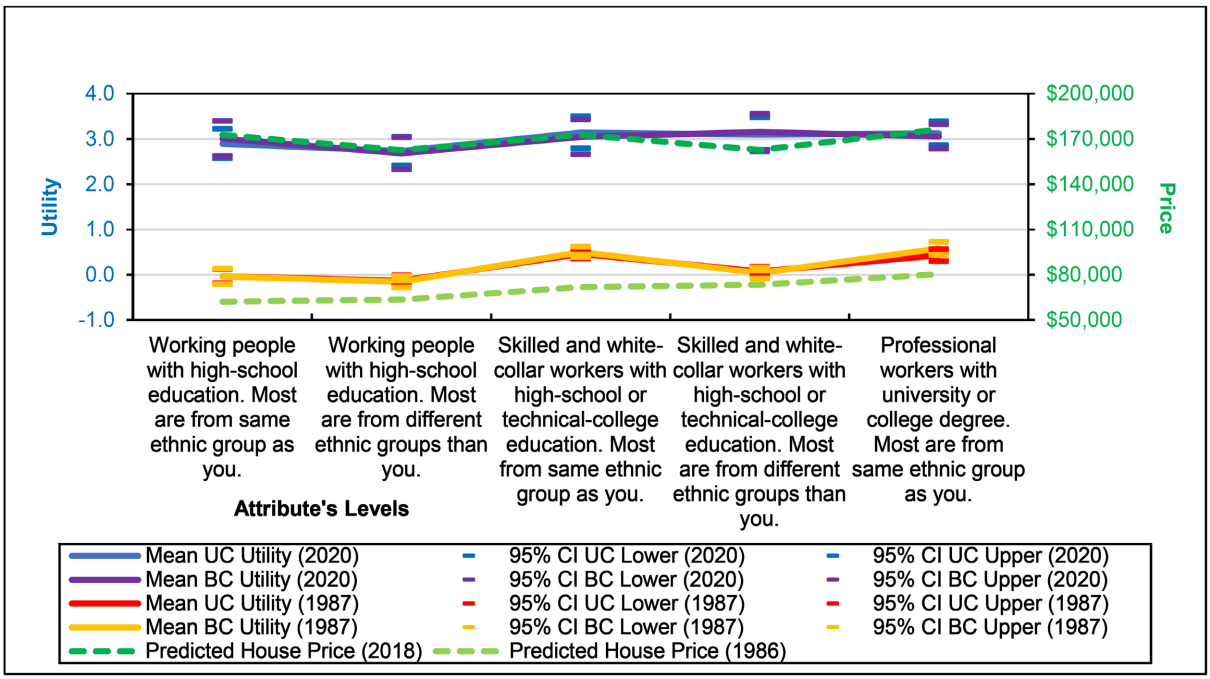


Figure 8. Ethnic group and education of neighbours unconstrained (UC) and budget-constrained (BC) mean utility functions and 95% confidence intervals (CI) lower and upper bounds, and predicted house price functions in 1987 and 2020.

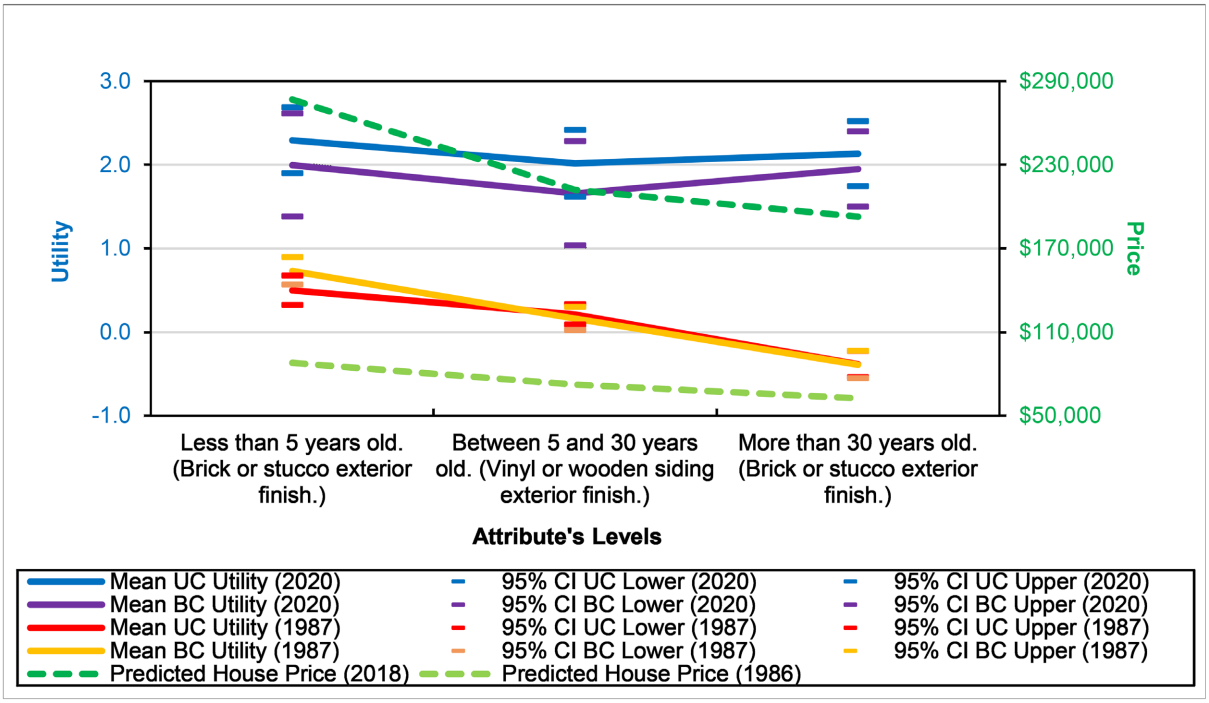


Figure 9. House age and exterior finish unconstrained (UC) and budget-constrained (BC) mean utility functions and 95% confidence intervals (CI) lower and upper bounds, and predicted house price functions in 1987 and 2020.

example, in Windsor in 2020 has a large lot, about 700 sq. m. or 60 ft. by 125 ft., and so the house is separated from neighbouring houses, with double attached or detached front garage; very mature landscaping, with lawns, large trees and dense shrubs; and a location within easy driving- or walking-access, up to 10 minutes to major stores and/or work; within 10 minutes walking to a school; and on the Detroit riverbank.

5. Conclusion

In conclusion, a resident may have at least two different cognitive scales of value in mind for evaluating the desirability of especially seven of 12 attributes of single-detached(-like) homes. One scale of residential preferences is composed of social utilities for attributes' levels, measured with data from two conjoint choice experiments. The other economic scale of preferences conforming with prices of these attributes' levels in the local real estate market is inferred from hedonic housing price models. Empirical differences for this conclusion are between socially and monetarily preferred attributes' levels of up to 70 respondents in each of Saskatoon SK in 1987 and Windsor ON in 2020. Respondents are representative of each other in these two mid-sized Canadian cities far apart in time, and so their social and economic preferences for home's attributes are comparable through time. Also, most respondents recently participated in the local real estate market, and so their willingness to pay for homes' attributes' levels should conform with the marginal implicit prices in the market.

Further proof of two scales of preferences is from differences between re-

spondents' socially and monetarily most preferred attributes' levels of single-detached(-like) homes. The gap in price between two attribute's levels is a consumption disequilibrium that a resident can resolve by spending more on their highest-priced monetarily most preferred attribute's level. A future research question is about the (in-)voluntary circumstances under which a resident's economic preferences will supersede their social preferences if they close these price-gaps by spending more on socially less preferred attributes' levels.

Meanwhile, additional expenditures in two mid-sized Canadian cities could be allotted to three attributes of the dwelling unit and one of the neighbourhood environment. Four attributes' price-gaps cumulate to 60% and 75% of the overall consumption disequilibrium of respondents in Saskatoon in 1987 and Windsor in 2020, respectively. A Windsorite in 2020 (or a Saskatonian in 1987) who, for example, wants their affordable highest-priced completely finished full basement with all modern features or interior/exterior renovations, needs to spend an average $42,654 or 22% (or $1411 or 2%) more than on their socially most-preferred unfinished or partly finished full basement with some modern features or renovations. Or they need to spend an average $26,202 or 13% (or $4753 or 5%) more than on a two-storey house with four bedrooms if they want a two-and-a-half storey house with four-and-a-half bedrooms. Or they need to spend an average $24,917 or 13% (or $6167 or 10%) more than on a house more than 30 years old with brick or stucco exterior finish, to have a house less than five years old with the same exterior finish. Or they need to spend an average $8948 or 6% (or $7098 or 10%) more than on a neighbourhood of single-detached homes with owner-occupiers if they want neighbouring high-rise buildings.

These sizable but affordable examples of consumption disequilibria illustrate their consistently larger amounts both in dollars and as percentages in 2020 than 1987, even after allowing for prices' inflation during the period. The first of two reasons for these differences is the better affordability for Saskatonians in 1987 of the ranges of attributes' levels' prices in the local real estate market, due to the positions of their budgets for housing within those price-ranges. Higher consumption disequilibria such as for Windsorites will therefore be experienced if seven attributes' levels' prices have wider ranges. Besides, more Windsorites have search prices for new homes either above or below the narrow ranges of predicted prices of five remaining attributes' levels.

Second, larger consumption disequilibria for same attributes' levels in 2020 than 1987 may be functions of respondents' individually different social utilities for attributes' levels of homes. For sure, Saskatonians and Windsorites have different mean utilities for at least six of 12 attributes' levels (Phipps, 2021). They however do not accentuate their social scales of preferences more, or less, than their monetized scales at particular times. Only two attributes' levels of house age and exterior finish and neighbours' ages are exceptions to subsamples of recent movers or thinking movers in both cities having the same socially or monetarily most preferred attributes' levels. Once again, therefore, a typical respon-

dent is not behaving as if asset accumulation potentials realized in prices for homes' attributes levels have superseded social needs and desires for at least five of seven attributes' levels, even at times such as after moving in or when planning on moving out.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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Appendix

Table A1. Attributes' levels of displayed homes, and their utilities and prices.

		1987 Saskatoon						2020 Windsor					
		Unconstrained		Budget-Constrained				Unconstrained		Budget-Constrained			
Attributes	Levels[a]	Predicted House Price	Mean Utility	Mean Utility	Number of Respondents	Mean Difference between BC Maximum Price and BC Most Preferred Price	Mean % Difference from BC Most Preferred Price	Predicted House Price	Mean Utility	Mean Utility	Number of Respondents	Mean Difference between BC Maximum Price and BC Most Preferred Price	Mean % Difference from BC Most Preferred Price
House Type and Size	Bungalow or one-and-a-half storey house. [With less than 950 sq. ft floor space.] Two bedrooms.	$62,243	−1.3	−1.4	9	$3813	6%	$167,520	2.3	2.0	9	$37,944	23%
	Bungalow. [With 1050 sq. ft. floor space.] Three bedrooms.	$68,980	0.2	0.0	18	$2316	3%	$166,185	2.5	2.4	11	$33,518	20%
	Two-storey house. [With 1250 sq. ft. floor space.] Three-and-a-half bedrooms.	$88,750	0.4	0.5	9	$3184	4%	$192,790	2.7	2.5	15	$27,882	14%
	Two-storey house. [Split- or bi-level with 1,400 sq. ft. floor space.] Four bedrooms.	$89,821	0.6	0.6	16	$4753	5%	$204,609	2.7	2.9	10	$26,202	13%
	Two-and-a-half storey house. [With 1700 sq. ft. floor space.] Four-and-a-half bedrooms.	$108,834	0.6	1.1	12	$0	0%	$230,811	2.4	2.6	3	$0	0%
House Age (and Exterior Finish)	Less than 5 years old. (Brick or stucco exterior finish.)	$87,893	0.5	0.7	29	$0	0%	$276,884	2.3	2.0	16	$0	0%
	Between 5 and 30 years old. (Vinyl or wooden siding exterior finish.)	$72,394	0.2	0.2	17	$6382	9%	$212,003	2.0	1.7	5	$64,881	31%
	More than 30 years old. (Brick or stucco exterior finish.)	$62,591	−0.4	−0.4	18	$6167	10%	$192,790	2.1	1.9	27	$24,917	13%
Basement Condition and Home Renovations	No basement or a partial one. No [some] central air conditioning and outstanding features if it is newer; or no [some] central air conditioning and major renovations if it is older.	$66,580	−0.7	−0.7	10	$2045	3%	$111,453	2.3	2.0	1	$177,309	159%
	An unfinished or partly finished full basement. No central air conditioning and outstanding features if it is newer; or no central air conditioning and major renovations if it is older.	$70,626	−0.3	−0.3	4	$10,857	15%	$119,893	2.4	2.2	12	$96,890	81%
	An unfinished or partly finished full basement. Some modern features including central air conditioning if it is newer; or some renovations, such as central air conditioning, new wiring, plumbing, windows and roof if it is older.	$72,125	0.1	0.0	5	$1533	2%	$192,790	3.3	3.2	18	$42,654	22%

Continued

	An insulated, completely finished full basement. Some modern features including central air conditioning if it is newer; or some renovations, such as central air conditioning, new wiring, plumbing, windows and roof if it is older.	$79,790	0.7	0.7	6	$1411	2%	$204,507	3.3	3.0	10	$84,255	41%
	An insulated, completely finished full basement. All modern features including central air conditioning if it is newer; or central air conditioning and extensive interior/exterior renovations if it is older.	$81,483	0.9	1.0	34	$0	0%	$288,761	3.2	2.9	7	$0	0%
Lot size (and Garage)	Small, about 400 sq. m. or 30 ft by 120 ft., and so the house is close to neighbouring houses. (No front driveway or garage.)	$69,570	−0.9	−0.9	9	$552	1%	$149,993	2.7	2.5	4	$33,416	22%
	Medium, about 500 sq. m. or 55 ft. by 110 ft., and so the house (is separated from neighbouring houses) [has space for a driveway at its side]. (Single attached or detached front garage.)	$74,539	0.5	0.6	10	$4260	6%	$177,184	3.4	3.4	21	$10,672	6%
	Large, about 700 sq. m. or 60 ft. by 125 ft., and so the house is separated from neighbouring houses. (Double attached or detached front garage.)	$79,864	0.9	1.1	38	$0	0%	$202,085	3.5	3.7	15	$0	0%
Landscaping	Newly planted, with sparse shrubs and thin trees.	$71,810	−0.6	−0.5	1	$3531	5%	$137,908	2.7	2.5	1	$25,228	18%
	Maturing, with lawns and some trees and shrubs.	$72,968	0.6	0.6	18	$1910	3%	$149,993	2.8	2.9	12	$13,144	9%
	Mature but overgrown and in need of replanting or pruning.	$74,145	0.0	0.0	5	$1196	2%	$156,427	2.8	2.8	7	$6710	4%
	Very mature, with lawns, large trees and dense shrubs.	$75,341	0.9	1.0	27	$0	0%	$163,136	3.0	3.0	20	$0	0%
Neighbouring Home Types (and Repair)	Almost all single-detached houses with owner-occupiers. (No houses in need of major repair.)	$69,374	1.0	1.0	56	$7098	10%	$149,843	2.7	2.5	21	$8948	6%
	Single- and semi-detached houses with mostly owners and some renters. (Some houses in need of major repair.)	$72,531	0.0	−0.1	0	$0	0%	$149,993	2.1	1.9	6	$8798	6%
	Includes some nearby modern walk-up rented-apartment or owned-condominium buildings. (Quite a few houses in need of major repair.)	$77,857	−0.5	−0.6	0	$0	0%	$148,649	1.8	1.7	7	$10,142	7%
	Includes some nearby high-rise rented-apartment or owned-condominium buildings. (No houses in need of major repair.)	$76,150	−1.0	−1.1	1	$1707	2%	$158,791	2.1	2.0	6	$0	0%
Ages of neighbours	Youthful single-person households [and mature families]. No children at home.	$72,986	0.1	0.1	12	$2176	3%	$167,682	2.9	3.0	5	$5107	3%
	Middle-aged residents. Elementary school-aged children at home.	$73,848	0.8	0.9	29	$1341	2%	$172,789	3.3	3.4	17	$0	0%

Continued

	Middle-aged residents. Teenaged children at home.	$74,646	−0.4	−0.4	4	$421	1%	$172,789	3.3	3.5	15	$0	0%
	Elderly residents [and older families]. With or without children at home.	$75,208	0.2	0.1	4	$0	0%	$171,069	3.1	3.2	2	$1719	1%
Ethnic Group and Education of Neighbours	Working people with high-school education. Most are from same ethnic group as you.	$62,224	0.0	0.0	13	$7487	12%	$172,687	2.9	3.0	10	$3697	2%
	Working people with high-school education. Most are from different ethnic groups than you.	$63,557	−0.1	−0.2	10	$5877	9%	$162,630	2.7	2.7	5	$13,754	8%
	Skilled and white-collar workers with high-school or technical-college education. Most from same ethnic group as you.	$71,862	0.5	0.5	20	$7393	10%	$172,789	3.1	3.0	8	$3595	2%
	Skilled and white-collar workers with high-school or technical-college education. Most are from different ethnic groups than you.	$73,401	0.1	0.0	3	$6977	10%	$162,726	3.1	3.2	12	$13,657	8%
	Professional workers with university or college degree. Most are from same ethnic group as you.	$80,378	0.4	0.6	18	$0	0%	$176,384	3.1	3.1	4	$0	0%
Mobility of Neighbours	Few neighbours move each year.	$72,988	0.6	0.6	47	$2020	3%	$176,279	2.9	3.0	19	$0	0%
	Several neighbours move each year.	$74,025	0.0	−0.1	2	$1051	1%	$172,789	2.6	2.7	15	$3491	2%
	Lots of neighbours move each year.	$75,076	−0.7	−0.8	0	$0	0%	$169,367	2.5	2.6	5	$6912	4%
Stores and Work Access	Within easy driving- or walking-access, up to 10 [15] minutes to major stores and/or work.	$74,661	1.0	1.0	46	$0	0%	$152,933	4.0	4.1	29	$0	0%
	Not too far from major stores and/or work, up to 20 [30] minutes by car or bus.	$73,807	−0.5	−0.5	3	$854	1%	$135,537	3.5	3.7	8	$17,395	13%
	Far from major stores and/or work, at least 30 [up to 60] minutes by car or bus.	$72,963	−1.2	−1.2	2	$0	0%	$120,121	2.8	2.9	4	$32,812	27%
Schools Access	Within 10 minutes walking to a school.	$74,023	0.9	1.0	45	$0	0%	$140,379	4.0	4.1	27	$0	0%
	About 20 minutes walking or 10 minutes driving to a school.	$73,920	−0.4	−0.3	2	$104	0%	$135,537	3.8	3.9	11	$4842	4%
	Up to 25 to 30 minutes drive or bus ride to a school.	$73,816	−0.7	−0.7	2	$207	0%	$130,353	3.3	3.4	3	$10,026	8%
(Riverbank) [or Park] Access	(On the Detroit riverbank.) [Down the street to a neighbourhood park.]	$74,355	0.9	0.8	41	$0	0%	$179,549	4.0	4.1	32	$0	0%
	(About 10 minutes walking of a few blocks to the Detroit riverbank.) [Within 15 minutes walking or 5 minutes driving to a neighbourhood park.]	$73,248	0.1	0.0	4	$1107	2%	$135,537	3.8	3.7	6	$44,011	32%
	Not conveniently close to (the Detroit riverbank) [a park.]	$72,157	−0.7	−0.7	6	$1465	2%	$100,811	3.2	3.1	3	$78,738	78%

[a]Windsor's possible new name of an attribute or its level is in parentheses, and Saskatoon's possible alternate wording is in square brackets.