



Combining preferences and heuristics in analysing consumer behaviour

Pere Mir-Artigues¹

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Abstract

This paper proposes a seminal model that combines heuristics and preferences to analyse decision-making processes related to the consumption of goods and services. The model has been built by recombining different results from economic psychology and in particular from the research programme called ecological rationality or environment-consistent rationality. With regard to heuristics and their algorithms, in addition to the well-known lexicographic rule, the importance of the heuristics of recognition, weighting and adding, sufficient satisfaction, reciprocity, default choice and imitate-the-majority heuristic in consumer behaviour is underscored. This last heuristic is complemented by the critical mass model and preliminary ideas on the loyalty effect. With respect to preferences, a distinction is made between elementary and final preferences, and between raw and inferential preferences. These two dimensions can be combined, giving rise to a conceptual framework which allows the concept of preferences to be consolidated and expanded. Although much work remains to be done, it should be stressed that this approach could be very fertile in gaining thorough understanding of the determinants of consumption choices.

Keywords Consumer behaviour · Heuristics · Behavioural economics · Microeconomics

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✉ Pere Mir-Artigues
pere.mir@udl.cat

¹ Department of Applied Economics, University of Lleida, Carrer de Jaume II, 73, 25003 Lleida, Spain

1 Introduction

It is common knowledge that within economic psychology,¹ the rapid-and-frugal heuristics research programme, also called ecological rationality or environment-consistent rationality, has focussed on the role of simple inferences in people's everyday decisions (Gigerenzer and Gaissmaier 2011: 454). In general, this research programme presents the following theoretical and methodological singularities (based on Martignon and Hoffrage 2002; Gigerenzer et al. 2008: 233–234; Berg 2014a; Tomer 2017: 30 and Schilirò 2017):

- The mind is a powerful toolbox to adapt to changes in context. The subject of analysis is the correspondence between decision-making procedures and the basic characteristics of the environment in which they are applied (Payne et al. 1988, Gigerenzer 2001; Gigerenzer 2008; Skořepa 2011: 46; Todd and Gigerenzer 2012: 8–12). Therefore, there is no definable benchmark for assessing the effectiveness of decision-making processes (Gigerenzer 2008). The normative quality is given by the finding that a procedure has yielded sufficiently good results in a certain kind of situations.
- Heuristics are straightforward but not simple inferences, ideal when there are many options, reality is full of uncertainty and accumulating more and more information can be counterproductive: the famous less-is-more paradox (See Medvec et al. 1995 and Gigerenzer 2014: 97). They are cognitive shortcuts like the rule of thumb initially used by carpenters to take measurements by eye, which was not an obstacle to doing a good job. The use of heuristic procedures does not necessarily have harmless consequences, as they seldom prompt decisions that harm individuals' physical integrity, lower their level of well-being, cause severe economic losses, etc. (Berg 2003; Arkes et al. 2016). Heuristics are neither fickle nor frivolous, so they do not reflect any allegedly flawed design of the human mind. On the contrary, they leave no doubt about its vast creativity and adaptability within the long and contingent evolution of the species (Gigerenzer 2014: 14; Gigerenzer 2018).
- People have multiple heuristics at their disposal. They choose the one that seems the most appropriate given the circumstances based on the information stored in their memory (which, in turn, reflects their experiences and cumulative knowledge) and the differences in their personalities (for example, not everyone is intuitive in the same way, nor does everyone have the same degree of anxiety). It is not surprising, therefore, that different people choose different heuristics.
- Heuristics support robust predictions about behaviour (Roberts and Pashler 2000). Analysts therefore design lab and field experiments with great care, as well as using mathematical simulation techniques (Berg and Gigerenzer 2010: 16–17). The aim is to improve decision-making in areas such as health, business, courts, etc. (Gigerenzer and Brighton 2009: 129; Gigerenzer and Edwards 2009).

¹ In this paper, the term economic psychology is preferred to behavioural economics as the latter is closely associated with the research programme on heuristics and biases developed by Daniel Kahneman and followers. On the history of the relationship between economics and psychology, see Heukelom (2014).

From this conceptual basis, this paper aims to discuss the role of preferences and several heuristics in the final consumption of goods and services. To begin with, Sect. 2 explains the concept of heuristics and lists the most relevant ones in consumption, and the term ‘preferences’ is modified. Section 3 presents the model itself, in which numerous factors are combined in a multi-stage process which ends up in a single final consumption decision. In this section, we discuss the peculiarities of the different heuristics in consumer decisions in some detail. The text closes with brief conclusions and prospects for future work.

2 Heuristics and preferences

Research has inventoried different heuristics used in individual economic decision-making, some of which have different algorithms.² There are five main heuristics:

- Recognition: The person considers all the options and chooses the one they identify at first glance (or the most quickly).
- Algorithms that indicate what to choose based on the cues, or attributes, of the different options in play, all of them previously recognised. Sometimes the choice is made for a single reason, whereas other times the options are subjectively ranked according to the priority assigned to their attributes. Finally, the option that passes a certain screening rule is chosen.
- Weighting and adding: The attributes of the different alternatives are compared with each other on the same level, although perhaps with unequal weights, and the consumer chooses the one that achieves the best value (high or low, as appropriate).
- Sufficient satisfaction: The person explores the different options in no particular order until one is sufficiently satisfactory, given their aspirations.
- Social: Individuals decide according to the rule of reciprocity or by imitating others.

These heuristics plus deliberation³ and giving up one’s own decision-making ability (either to a random device or to third parties⁴) make up the three major

² Heuristics and algorithms are fully activated in group decisions. Collective decisions also include agreement and conformity mechanisms.

³ Slow, systematic reflection involves carefully considering the options and their attributes and, if needed, using sophisticated computational techniques such as statistical regression, decision trees, neural networks and so on. It is a cumbersome and costly decision-making method, although it cushions the regret quite well if the choice is a fiasco, while also providing reasons to defend the choice made to third parties (it avoids giving the image of having improvised). Detailed deliberation as the best way of taking decisions is discussed in Hammond et al (2002), Raiffa et al (2002: 14–52) and Spetzler (2016). In any case, deliberation does not require the fulfillment of certain axioms, nor does it presuppose that the outcome reached will be optimal. It only suggests that detailed reflection leads to better results than would have been obtained without such deliberation.

⁴ Random results can be generated by flipping a coin or rolling a die (without tricks). Recourse to chance is rare in public affairs, even though social housing may be allocated by lottery, and much rarer in the individual ones (Elster 1988). When a third party is chosen, it may be a person who has sufficient knowledge about the decision, or the decision-making process may rely on devices and big data analysis algorithms, probably owned by a firm (Christl and Spiekermann 2016).

patterns or basic ways in which humans approach inferential choices. All of them can be applied in consumer choices, but this paper only considers heuristics.

Preferences are manifestations of attraction under the influence of beliefs, emotions and information stored in memory (Elster 2007: chap. 9; Hausman 2012: 112–114). They are subjective appetencies in the sense that they are strictly personal and constantly compared (“I like *A* better than *B*”) (Hausman 2012: 1, 6). Although preferences cannot be assessed according to objective criteria (Gilboa et al. 2012: 22), analysing the psychosocial factors that originate and modify them is of the utmost importance (Luan et al. 2014: 503). Unfortunately, the way preferences are formed may be very difficult to elucidate, as they reflect the influence of hidden factors within people’s socialisation process. Fortunately, these obstacles are minor when studying the ways in which preferences can be modified. Preferences also incorporate the intention to choose, although the choice does not necessarily have to be effected, among other reasons due to the presence of restrictions.⁵ Finally, the choices that drive preferences are accompanied by justifications (including not knowing why one has chosen what one has chosen).

What should be emphasised here and now is that economic psychology proposes a twofold distinction within the term ‘preferences’ (Skořepa 2011: 31–32):

- Elementary and final (or total) preferences, depending on their degree of persistence.
- Raw and inferential preferences, depending on how they arise.

All people maintain quite defined and persistent preferences over time, yet simultaneously have sudden inclinations at a given time and place. For example, clothing habits do not preclude a strong advertising campaign, a temporary deal, a salesperson’s skill, etc. from leading in a person to buy a different model from the usual one. While elementary preferences tend to change when the state of the world changes (e.g., the individual’s income level), final preferences are highly vulnerable to stimuli received by the person in the vicinity of the act of consumption.

Raw preferences are closely associated with people’s gut tastes and desires. For this reason, they determine choices immediately: “I cannot resist chocolate”. The person simply confirms that the choice made is pleasurable and stops thinking about it (Gilboa et al. 2004: 11). In contrast, inferential preferences are the result of a more or less careful inspection of the available options. Not infrequently, these inferences include benchmarks: option *A* is chosen since it contains an amount of a given attribute above (or below) a certain threshold. It should be noted that the reference may be based on arbitrary assumptions (Ariely et al. 2003). Obviously, if the reference changes, so does the choice.

Typologies of elementary/final and raw/inferential preferences could be combined, as shown in Table 1. The mix of raw/elementary preferences corresponds to internalised and therefore enduring tastes. However, some elementary preferences may be temporarily suspended until the object in question has been internalised, as

⁵ Psychology focuses on motivations and desires, while also conferring a secondary role on restrictions.

Table 1 Expressions of preferences

Preferences	Unveiling process	
	Raw	Inferential
Character		
Elementary	Particular tastes	Novelty integration
Final	Sudden appetite	Detailed examination

Source: Own elaboration

in the inferential/elementary combination. For example, when people face a new ingredient, even if it does not prompt any strong rejection, the lack of previous experience can delay their trying it. The combination of raw and final preferences encompasses cases of sudden changes of appetency: “I like *A* a lot, but I choose *B* because I want to imitate the other diners”. Finally, in an exotic restaurant, the choice among various unknown dishes triggers the formulation of inferences (e.g., associations that presumably inform on their flavours). If no conclusion is reached, choices can always be random.⁶

3 Heuristics and preferences in consumer behaviour

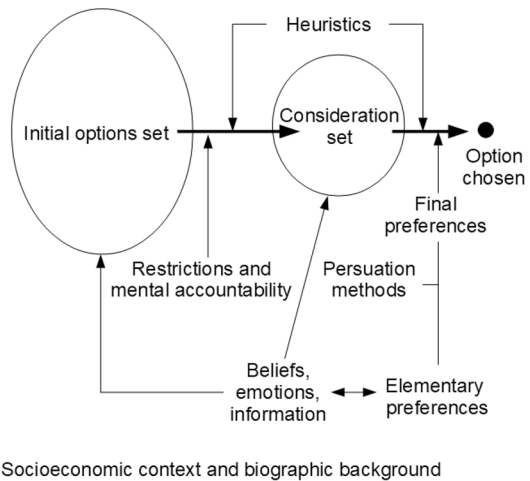
In consumption decisions, heuristics and preferences are combined in a flexible sequential manner and with varying degrees of intensity. One of these elements may even act exclusively, especially when raw preferences are activated. In contrast, when it comes to buying a mobile phone, consumers are interested in the features of the models on sale. It doesn’t matter if they do not fully understand some attributes because they only consider familiar brands, i.e., those that are trustworthy, a condition reinforced by what relatives and friends have said about their quality, and encased by budgetary and other restrictions. Regardless, heuristics and algorithms combined with the two dimensions of preferences make it possible to distinguish different consumption processes. To correctly tackle this entire casuistry, a model is needed, even if it is a preliminary one. Figure 1 shows a general scheme of the combination between heuristics and preferences (and their associated elements, such as beliefs, emotions and information).⁷

To begin with, the model identifies a hypothetical initial options set, the size of which is usually considerable. This set encompasses a wide range of brands of goods and services of a certain kind, together with their variants. Of course, this set contains not all the existing possibilities but those that are usually found in the most frequently visited sales points. For example, if a person is vegetarian, they will pass over many of the food products usually on sale; likewise, if the purchase is highly emotionally charged, as in the purchase of a clothing accessory, the person will only

⁶ As can be seen, all the examples come from the world of food, an inexhaustible source of examples related to the contingent construction and unexpected alterations of preferences.

⁷ The model was inspired by several works, such as Marewski et al. (2010: 288), Hauser (2014), Szmigin and Piacentini (2015: 81, 94), Gigerenzer (2015: 128) and Mousavi et al. (2017).

Fig. 1 A map of consumption choices



be interested in the models that project their desired social image. The initial options set, under the influence of economic constraints, especially the price and the budget allocation set by mental accounting, then collapses into the consideration set, which is always smaller (Yee et al. 2007; Hauser 2014). Heuristic algorithms also play a role in this process, as in the case of the consumer who after identifying the famous brands, only considers the affordable ones. As the figure shows, the final choice takes place within the consideration set. It is influenced by:

- The examination rule of a given algorithm, which determines the choice.
- Persuasion techniques such as foot-in-the-door, low-balling, priming, framework and anchoring effect and so on (see Joule and Beauvois 2104; Cialdini 2017).

As expected, this entire process takes place within a certain socioeconomic context and biographical background, which is always being both permanently and partially modified (Earl 1995: 70).

Heuristics are active throughout the decision-making process, shrinking both the initial and the consideration set. However, what heuristics are they? The hypothesis is that in the world of consumption, the recognition and fluency heuristics, the lexicographic rule, sufficient satisfaction and the imitate-the-majority heuristic should be highlighted. The paragraphs below justify this selection.

Recognition heuristics refers to the mind's ability to activate the sense of familiarity with all kinds of objects, even if previous contact has been transient (Goldstein and Gigerenzer 2002; Gigerenzer and Goldstein 2011b; Pachur et al. 2012). This presentiment should not be confused with the search for information stored in memory (Mousavi et al. 2017: 284). Having difficulties remembering something does not prevent the impression that it is familiar from arising. The presence of a simple sensory input is usually enough to immediately trigger a sense of familiarity: we have all seen a face that looks familiar, even though our memory may take time, or even fail, to figure out who it is and where we have seen it. Under normal conditions, just

seeing a logo or an acronym, hearing a certain musical tune, perceiving a certain smell, etc., is enough for people to instantly identify the associated object of consumption (Schwartz 2016: 56). This does not preclude the possibility that if a person is approached unexpectedly, they will often be unable to name many brands of a certain type of good or service. However, all they have to do is see them for a fraction of a second to identify the product in question and evoke the features attributed to it. And the imprint is more intense if it triggers emotions.

The recognition heuristic is not blind. Take the case of people with partial but enough experience to rapidly ignore the type of underbrush inappropriate to finding mushrooms. However, this does not mean that the same heuristic will be applied to choose the ones they actually pick. In fact, since there are highly toxic mushrooms, they will only put those that they know for sure are not dangerous in their basket. While there is a strong correlation between the type of underbrush and the presence of mushrooms, there is not necessarily between the abundance of mushrooms and their edibility. However, in a restaurant specialised in mushroom-based cuisine, given that the know-how of those in charge can be trusted, this person will eat all the mushrooms on the dish, even if they do not recognise any of them. This example reminds us how the effectiveness of the recognition heuristic depends on contextual characteristics.

The fact that recognition comes to consciousness faster than memories has an undoubted adaptive value: immediately identifying what is beneficial (for example, the chemical trace left by a prey) or harmful (a suspicious vibration behind a bush) is a key issue in the survival of living beings. In the field of consumption, people apply the heuristic of recognition massively: they are inclined to buy only the brands they recognise. If it is the first time they see it, or if it does not make any impression, they infer that the brand is not worth buying. This mental shortcut therefore not only identifies the option to be chosen but also endorses its degree of trustworthiness (Gigerenzer 2015: 121). As a consequence, the use of the algorithm is self-reinforcing, giving rise to a solid routine. Its use will continue until a veritable avalanche of information advises against it.

The role of the recognition heuristic in consumption cycles is unquestionable: it quickly narrows down the initial set and quite often points directly to the option to be chosen. From this point of view, the enormous resources earmarked to advertising and promotional campaigns are nothing more than an attempt to buy consumers' neural space. This is a creative effort to facilitate brand recognition, a goal which is usually enhanced by mixing them with beliefs and emotions with the enthusiastic complicity of a certain pop sociology and the media. Indeed, advertising messages tell why a given brand should be consumed, with whom and at what time. In other words, they show the conditions for consumption to be satisfactory and effective. There is no doubt that the differences created by branding are small, but they are noticeable enough to be distinguished from each other. However, the latency of familiarity and attributes that supports it in the mind is limited, even more so in a social context infested by advertising claims. Therefore, effective advertising requires persistence and accessibility. If this effort is abandoned, the brand's market share is likely to begin a slow but steady decline. Hence the importance of the brand being present everywhere: in successful films and TV series (or product placement,

see Cialdini 2017: 184, 405), in spots and advertising panels on streets and roads, on all kinds of merchandising objects, in the media, on the social media, etc. (Kurz-Milcke and Gigerenzer 2007). At the same time, brand must be available in as many and as varied outlets as possible. As a result, the most recognised brands are considered the most suitable and vice-versa. In general:

- Recognition makes it easier for the brand to become part of the appetite: people taste the brand before they even taste the product itself. Moreover, identification connotes trust, which powerfully shapes final preferences.
- The routine generated is reinterpreted as preference, so recognition promotes loyalty.⁸ However, this loyalty is hardly ever absolute: frequent customers do not hesitate to switch brands, even temporarily, if a sign catches their eye (Szmigin and Piacentini 2015: 358, 367–368; more on loyalty below).

In everyday shopping, familiarity, routine and loyalty end up being indistinguishable: a given brand is bought because it is currently bought, a fact which denotes convenience and accessibility.

The heuristic of fluency means choosing the most quickly recognised option, even if all of them are recognised (Gigerenzer and Gaissmaier 2011: 462). This heuristic is based on the mind's agility when processing information. It assumes that people are able to discriminate these reaction times and that there is a direct link between the value of an option and the speed with which the impression of familiarity emerges (Mousavi et al. 2017: 285). For example, the presence of fluency has been detected in the very short term development of stock values (even more so if the company and its identification code are easy to pronounce, as reported in Alter and Oppenheimer 2006) and in the perception of the purchasing power of coins and banknotes (see Alter and Oppenheimer 2008). However, because people have particular personalities and experiences, fluency rates can differ. This result is clearly related to the frequency of previous exposure and the stimuli received in the moment (thus, for example, having heard a brand repeatedly speeds up its recollection from memory, which gives it a halo of relevance).

Another important set of heuristics activates inferences based on inspection of the attributes of the options under consideration (Katsikopoulos 2014). Sometimes it is just a specific signal that is assumed to be closely associated with the target variable, which is probably not directly observable. This is the case of one-good-reason heuristics (Goldstein and Gigerenzer 2002; Katsikopoulos and Gigerenzer 2008; Gigerenzer and Goldstein 2011a and Gigerenzer and Gaissmaier 2011: 463).⁹ In the consumer sphere, for instance, advertising often emphasises the reason for buying a

⁸ Routine is related to the term “doing the shopping”, while the expression “going shopping” connotes shopping with a playful component. Since consumers are not in a hurry to determine what attracts them the most, predicting these latter purchases is especially difficult (Szmigin and Piacentini 2015: 101; Trentman 2016: 93).

⁹ This is also observed in nature, especially in the mating season. For example, female peacocks choose to mate with the male with the showiest tail, an attribute that reflects its vitality; for deer, it is the size of antlers which garners attention; in certain frogs, it is the power of the croak, and so on.

certain brand. All other possible reasons do not matter. Likewise, managers of companies and institutions make many decisions for a single (good) reason (Wübben and Wangenheim 2008; Artinger et al. 2014). It is more common to consider various attributes of the options at hand. An algorithm is then applied that inspects the value of these attributes, either sequentially or hierarchically. In this process, options are discarded until only one is left, which will be chosen (Gigerenzer et al. 2008: 231). It is essential to underscore that inspecting attributes in consumption decisions was detected many years ago: it is the lexicographical algorithm. This rule consists in ranking attributes according to consumer preferences and the elements that go with them, and then initiating a process in which the options which do not meet certain pre-established requirements are eliminated.¹⁰ Attribute-based selection is common in the case of durable goods (clothing, appliances, automobiles, housing, etc.) and important services such as schools, telephony, electricity or leisure (Kurz-Milcke and Gigerenzer 2007). These consumption decisions share two important features: on the one hand, prices and/or financial obligations (periodic bills for consumption or loan repayments) are significant in relation to income, and on the other hand, they have multiple attributes (functional, status, aesthetic, etc.) which can be more or less objectively identified.

From a psychological perspective, these algorithms have the following unique features:

- Prior to applying them, people have to identify the attributes they consider relevant. Normally, this number is likely to be around four, but it depends on the number of options. For sellers, it is important to know this selection and its hierarchical layout. That makes the sales process easier: the options most closely related to a particular attribute set are displayed at the outset.
- The rank of attributes depends on opinions received from others, one's own beliefs and aspirations, persuasive advertising and so on. Moreover, budget constraints should not be forgotten, as price is often one of the most salient attributes (Kurz-Milcke and Gigerenzer 2007).
- The choice is always determined by the least important of the characteristics considered. One example is people who claim to have bought a certain car model because of the chrome plating, a very secondary attribute compared to price, engine power or fuel consumption. Therefore, details matter, and a lot. Regardless of what the advertising highlights, be it functional traits or generic emotions (desire for status, reliability, etc.), goods and services cannot neglect the details since they distinguish the product and positively surprise customers. As a consequence, utilities and gadgets determine quite a few purchases. Any automobile or appliance salesman is aware of just how important they are.

¹⁰ There are two variants: the conjunctive rule, in which the consumer inspects the attributes of products sequentially and in no particular order, discriminating among them according to certain thresholds they have established in advance; and the elimination-by-aspects rule, which combines hierarchical arrangement and threshold values.

- If the ranking of attributes changes, the option chosen changes as well. The hierarchical order is particular to each individual. This reiterates the seller's interest in knowing customer priorities: their initial question is always, "What have you been thinking?" The vendor then builds the appropriate argument, which always ends up focussing on the details.
- The algorithm is inadequate for choosing between options with qualitative aspects or permeated with uncertainty. It requires features that are easily sortable and/or evaluated by simple metrics.

The third type of common heuristics in consumption decisions are weighting and adding. They bring together algorithms that lead to direct comparisons of attributes and, by extension, options. Although there is no hierarchy, attributes may have different weights (Payne et al. 1993: 24). This heuristic is applied many times in everyday life. For example, a person wants to buy a cake, so when they reach the shop window they inspect which cakes are on sale. It should be noted this is a negligible expense, they are perfectly aware the product so there is no room for surprises and the range of goods will not change until tomorrow, a time horizon outside of the selection process. The consumer sees that today there is a choice between cream and chocolate cakes. Both are appealing to them, although they wonder if they might like the cake with a lot of cream better than chocolate. More specifically: how many units of cream make up for the loss of one unit of chocolate? Therefore, the consumer establishes a cream/chocolate substitution rate based on raw preferences, which is obviously only valid for the day and place in question.¹¹ Unfortunately, things are usually more complicated. On the one hand, if there are n options with k attributes each, there are,

$$\frac{nk(n-1)}{2}$$

in pairs possible comparisons. Therefore, the attempt to undertake a comprehensive comparison will rapidly become intractably large. On the other hand, if this heuristic opens the door to establishing substitution relations between attributes and, by extension, options, this pretence clashes with the degree of dissimilarity between them. If attributes or options belong to the same class, applying the algorithm is not a problem. If their incommensurability is manifest, the comparison will be forced, even absurd. It should be added that applying such algorithms is more feasible if the consequences of the decision are foreseeable and negligible. If the stakes are high, the process of weighting and adding up can be very distressing.

The heuristic of sufficient satisfaction was formulated by Simon (1916–2001) when he was studying the nature of human rationality. In it, he establishes the postulate of bounded rationality: people can only store and evaluate key decision-making information in a limited way, a constraint aggravated by the fact that reality is complex, uncertain and contingent (see Simon 1959: 277, 1987a, 2000; Payne et al.

¹¹ If the consumer had ruled out chocolate-free cakes from the outset, i.e., the remaining ingredients are unimportant in the absence of chocolate, they would have established a hierarchy of attributes so they would be applying a lexicographic rule.

1993: 26; Gigerenzer and Goldstein 1996; Selten 1998, 1999; Harstad and Selten 2013; Altman 2017). The postulate does not claim that humans are irrational in the sense of repeatedly making the same mistakes; rather, it only states that the mind's capacity to process information is not colossal, while confirming that reality can never be known in its totality. Simon also indicates that cognition and context form an inextricable whole, like the two cutting blades of a pair of scissors. Thus, if attention is only paid to the mind, then it is inevitable to conclude that heuristics reflect the weakness of human cognition. If research only focuses on the context, individuals become mere particles that react completely predictably to environmental stimuli (Gigerenzer 2008). In short, Simon understood rationality as a property emerging from the confluence between mind and situation (Todd and Gigerenzer 2000: 730). This explains why humans are neither perfectly rational nor inevitably irrational. Human rationality is complex, singular and paradoxical. It can be genuinely creative, but it is also highly impressionable. While fairly predictable, it is not infrequently surprising.

In the process of grasping and adapting to the context, people accommodate the option of satisficing, a term born from the combination of satisfying and sufficing (Simon 1987b; Rutherford 1988: 51). This heuristic considers options one after the other in no particular order. The first one to reach a certain level of aspiration stops the inspection, so the sufficiently satisfactory option is chosen. Any remaining alternatives are ignored. The satisficing threshold is unique to each person given their lifestyle and expectations (personal, professional, financial, etc.). Unfortunately, if no option is satisfactory enough, people usually lower their goals (Mousavi et al. 2017: 286).¹² This general hypothesis also applies in the field of consumption, where it has unique features. When the role of advertisement and persuasion techniques are taken into account, the search for a satisficing product or service become easier: brand recognition simplifies the task of knowing whether the customer has been sufficiently satisfied with the purchase.¹³

Social heuristics are the last to be described. They encompass several algorithms which are used when people establish relationships with each other. Sometimes they try to respond to others' actions, while in other cases, people anticipate and react to others' previous decisions. Although the attention effort is exhausting and the interactions can be very intricate, nothing deters humans from constantly making inferences about the (re)actions of others. Among the many social heuristics, the following three stand out for our purposes (Gigerenzer and Gaissmeier 2011: 471–473; Sofo et al. 2013: 4–6):

- Reciprocity, which is the basis of the sophisticated conditional cooperation among humans (Fehr et al. 2002; Fehr and Fischbacher 2005; Samuelson 2005; Hare 2007 and Silk and House 2011). This social inclination has facilitated the

¹² As can be seen, the heuristic of sufficient satisfaction is twofold in nature: it reflects a particular conception of rationality and is an algorithm for making decisions (Todd and Gigerenzer 2000: 731).

¹³ A well-known experiment shows how important presentation is in choosing a product: a very high-quality wine packaged in a bottle with an unattractive label and a neglected appearance will have little success. The opposite holds true with a low-quality wine that comes in a package that connotes pedigree.

survival and expansion of the human species because of the achievements it allows, the reduction in internal tensions it guarantees and the ability it gives compact groups to face threats coming from the natural environment, and especially from other rival groups.

- The heuristic of the default choice, that is, acceptance the first proposed option. Nothing else is needed. This is a social heuristic since this proposal has undoubtedly been designed by third parties.
- Imitation of others, especially if the goal is to be accepted by the group as quickly as possible. We should recall that together with language and learning, imitation is one of the key processes of cultural transmission.

Since others' minds cannot be read directly, recourse to social heuristics is unavoidable (Gigerenzer 2015: 136). These shortcuts ultimately expand the resources that evolution has made available to living beings to adapt to ecosystems. However, the requirements of the social environment are much greater.¹⁴

All these social heuristics are common in consumption decisions. Although imitation stands out, reciprocity and default choice are worth describing. Exploiting reciprocity takes many forms. However, the sales trick known as "the foot-in-the-door" has astonishing success in modifying elementary preferences (Joule and Beauvois 2014: 95–115). In this algorithm, the vendor simulates an interest in improving the welfare of the person they are directly addressing and expects that this person will act in fair reciprocity, that is, by purchasing the good offered. Something similar is attempted in supermarket aisles when free samples of a product are given away. The salesperson hopes the customer will repay this show of generosity by buying the product.

People guided by default choice choose the first option suggested. They neither are interested in the cues, nor do they make the slightest effort to look for more information. There are several reasons for the default choice: laziness, the urgency to choose and above all the belief that there is no better alternative than the one proposed (perhaps because it deserves our complete trust).¹⁵ Obviously, the default choice can be risky. For example, it is said that in some American cities, if the taxi ride is paid by card, the customer has to choose the tip percentage among the proposed options, all of which are high. Despite this, very few choose the option of not adding a tip (Sunstein 2015: 27–28). In general, the economy is full of default conditions: they are more or less explicitly common in contracts to be signed or agreements to be adhered to. These commitments should merit careful attention and be the object of a minimum of reflection, but there is not always enough knowledge, time, negotiating power, etc. available.

¹⁴ It should be noted that the study of social heuristics sets aside moral evaluations because it is only interested in whether or not the desired adaptation has been achieved (Gigerenzer and Gaissmeier 2011: 471, 473).

¹⁵ There are two ways of choosing not to choose: the first is by consent, that is, the default choice; the second is to go away without having chosen anything.

Both animals and humans run away when they see others running away. They are worth imitating because the cost of a possible false alarm is lower than the cost of being caught and eaten or injured. Beyond emergency situations, in everyday social, political and economic life, people systematically scan others' decisions and results. Depending on the results, why not copy them? For example, despite the fact that managers of many companies have sophisticated tools for setting the prices of their products, empirical studies indicate that in a context of limited information, the basic criterion is to look around and adjust to competitors' prices, a comparison subject to the desire not to weaken the image (recognition) of one's own brand (Rusetski 2014). Something similar happens when companies decide where to locate their facilities (Berg 2014b).

The heuristic of imitating others makes complete sense in situations where social interaction is strategic: individuals' decisions depend heavily on their expectations about what others will decide. Mathematician and Nobel laureate in economics Schelling (1921–2016) was a pioneer in modelling interdependent behaviours. He was not interested in highly regulated interactions, such as the explicit, unequivocal and exhaustive rules of board games. In everyday life, things are more complicated: social norms are combined with individual actions induced by what we believe others will do, and in turn, others decide what to do based on what they believe about our actions. Cross-social influence causes a mutual carry-over effect, either by direct interaction between individuals or by a conviction (belief) about what others will do. This gregarious impulse can become explosive if people end up persuaded that a vast majority will act in the same, identical way. The critical mass model developed by Schelling (2006: 91–110), with contributions from Simon (1954) and Granovetter (1978), attempts to represent the phenomenon.

Technically, the expectation about others' behaviour must exceed a certain threshold, beyond which the process creates a feedback loop: at first it is barely self-sustaining, then it starts to grow, first quickly and then more slowly until it finally stops. The dynamic is similar to a nuclear reaction. Thus, attending a public event (concert, exhibition, conference, etc.) ends up being massive (the available space is full) because everyone has been convinced, over a short period of time, that everyone else will attend. However, this herding motivation has two exceptions: the minority of individuals who plan to attend regardless of the presumed expected attendance level for the simple reason that the event interests them, and those who, precisely because everyone is expected to attend, do not go (snobbish behaviour). Inspired by the considerations set out in Schelling (2006:104), Fig. 2 shows the basic elements of the critical mass model: there is a minimal number of people participating in an event (A), some of whom try to convince others, which, together with the organisers' promotional actions, creates the feeling that attendance will be massive. If this expectation spreads, success is guaranteed (total number of participants, N). However, there is a certain number of potential participants with snobbish inclinations towards the event (B). Therefore, the real number of attendees is slightly below the absolute maximum. The shape of the curve indicates the trajectory of the number of participants: at first it is flat because the belief in mass attendance is not strong enough. After a certain threshold (U) the number of attendees skyrockets as expectations encourage others to participate. Finally, attendance grows at a progressively

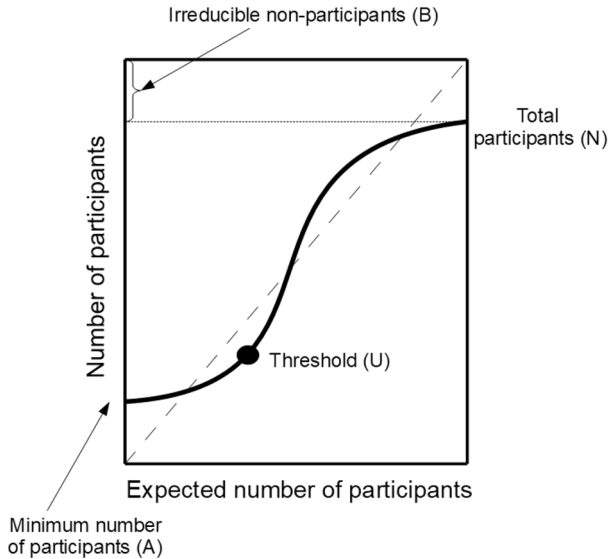


Fig. 2 The critical mass model

lower rate until the irreducible group of non-participants is delimited. It should be emphasised that the model assumes that only the minimal number of attendees is driven by their preferences. For this reason, the final result does not mean that the potential participants share the same preferences, have identical beliefs or manage the same information. The relevant factor has been pure imitation of the behaviour observed in others.¹⁶

Despite its simplicity, the critical mass model describes behaviour better than it seems. In the United States, an experiment was conducted where participants could download the music of their choice from the Internet. Some subjects were informed in advance of the download ranking, while others were not. It should be noted that even false rankings were used to encourage people to choose their music, which made them very popular, regardless of any other considerations (Sunstein 2014: 47–48). The belief that something will become popular makes it so. It is not strange, then, to find people who say they do not have much predilection for the object, or activity, itself but who buy it, or go to the place, because it seems that others will also do so. In fact, if for any reason expectations are not met, attendees are usually more perplexed than angry.

This predisposition is also exploited by the commercial stratagem which consists in paying (or giving small perks to) dozens or hundreds of people for hours queueing in front of the sales places of a certain new item (software, novel, etc.). This attracts the attention of passers-by and especially the media, which spread it around

¹⁶ Obviously, not every successful call is explained by the mechanism of critical mass. People may also attend under threat, because of social norms, etc.

the world. The promoter hopes that the display of the product's (presumed) popularity will attract many other buyers: What are you waiting for to buy it? Can't you see that everyone else is doing it, too?

As a general rule, the heuristic of imitating others makes it easier to be accepted by the group. It therefore has a strong socialisation value: it is about observing people's choices in a certain type of circumstance (such as the clothes they wear) in order to identify the one that best characterises the group in question (a certain brand).¹⁷ The decision to be taken is whether to act in the same way, perhaps not too quickly, but without too much delay either.

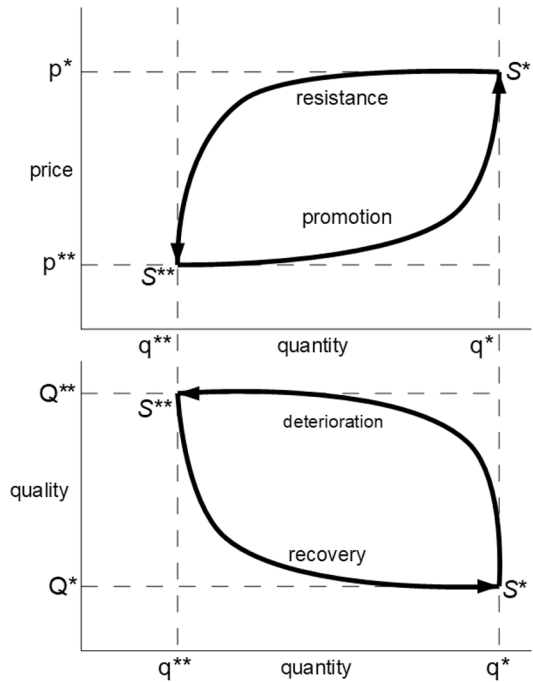
There are also situations in which the imitation heuristic is combined with other heuristics, such as with the lexicographic algorithm. This is the case of commercial novelties (new brands or variants). When there are no closely similar precedents, as with the first personal computers or mobile phones, people are interested in the functional features of the product, yet at the same time, they reject surprises. Therefore, they tend to buy the model already owned by other people they know who say they are satisfied with the device (Earl 1995: 77).

The concept of novelty deserves more attention, given its importance in the consumption of goods and services. With a radical novelty, manufacturers exploit differentiating features in an attempt to confer prestige on the product. This is a useful stratagem in case of a connoisseur's goods, as their prices are comparatively high and only a few can afford them. However, even in common goods and services, new variants are regularly released. The reason is the attention they receive, if even momentarily, from consumers. In reality, renewed products attempt to attract new buyers without losing their regular ones. How can this be achieved? By wrapping any new variant in slightly novel features, along with their corresponding narrative, without actually discarding and indeed often reiterating familiar attributes. In other words, by incorporating redundancy into the novelty. By doing this, its recognition and the trust it inspires do not suffer any losses. There is no doubt that a variant that is identical to an existing version, both substantively and in the associated story, fails to capture customers' attention. However, attributes that are too far from the familiar ones entail the risk of being perceived as strange, eccentric and unpredictable. Intense stimuli only attract a minority. Too much novelty leads to failure. Moreover, because every person has partly singular, partly shared socio-biographical traits, manufacturers easily find ways to introduce novelties and variants. A promotion is more persuasive if it is announced by a celebrity, whose image is surrounded by a halo, which is also a creation of advertising.

The brand loyalty effect has been indirectly introduced in the analysis in the above paragraphs. For example, because it plays a key role in final preferences, retailers promote commercial loyalty cards which allow holders to take advantage of systematic deals. Although they are presented as a kind of reward for regular customers, they are actually intended to establish a subtle bond between salespeople

¹⁷ The imitation algorithm is common in goods and services that act as lifestyle signals and their concomitant status level. Brands of clothing, footwear, accessories, etc. facilitate both recognition and social acceptance.

Fig. 3 The loyalty effect



and customers. However, this well-known tool aimed at building consumer loyalty is non-linear. Indeed, although it slows down the loss of dissatisfied buyers and users, it also amplifies the difficulties in attempting to win them back. Loyalty complicates the relationship between consumers and brands: even if the brand is recognised, it cannot be purchased because it is no longer trusted for some reason. This effect could neutralise the influence of heuristics on final preferences. Figure 3 shows the loyalty effect (the lower part is directly inspired by the considerations set out in Hirschman 1970: Chap. 7 and the upper part is own elaboration).

The figure requires careful interpretation since it combines three variables, price (p), quantity (q) and quality (Q), and different states of the world, i.e., the points S^* and S^{**} and the arrows joining them.¹⁸ We start from S^* , a state in which a quantity q^* of a good or service is sold at a price p^* and quality Q^* .¹⁹ From then on, the quality begins to deteriorate, which initiates a shift to the state of the world S^{**} . Customer loyalty means that the initial drop in sales is very small, so sellers do not change prices. For instance, this would be the case of an extremely prestigious restaurant. The loss of quality, for whatever reason, does not spark immediate abandonment by its demanding clientele. Customers consider this a temporary problem. However, if the quality does not recover, the loss of customers will accelerate and sales will drop significantly, even if the company lowers prices, as it does in the

¹⁸ Curbed arrows represent transitions from one state in a given time to another state in another time.

¹⁹ Note that, for reasons of graphical coherence, the loss of quality gives rise to higher ordinate values, that is, $Q^* > Q^{**}$.

figure. Some customers may even see this decline as the confirmation of the lower quality. However, when the company reaches state S^{**} , in which prices, sales and quality are low, managers decide to restore the prestige and lost customers, that is, to return to the state of world S^* . In particular, the decision is to keep prices low while improving quality. Unfortunately, it takes time for sales to rise. A lot of promotion and a considerable increase in quality are needed to get a significant sales response and, if successful, boost prices and business profitability. The reason is former customers' distrust; completely disappointed, they are determined not to return to that restaurant. This is a logical attitude given the patience they showed and even the explicit warnings they gave about the loss of quality, which went disregarded. In short, loyalty increases tolerance for comparatively higher prices and/or quality drops. However, if trust is permanently lost, recovering the clientele will not be easy because their loyalty was betrayed. Loyalty stops a business from losing customers, and from winning them back.

4 Conclusion and future work

In this paper, we have only designed a general model combining heuristics and preferences and discussed its components to a certain extent, focussing on an analysis of consumption choices. Two features of the model deserve to be highlighted: the view of consumption decisions as processes with two major stages, and the connections and effects of their different elements. These stages fall between the distinction between the initial set of options and the consideration set, and the latter and the option chosen. In these stages, different heuristics and preferences, with their own restrictions, progressively limit the number of options that can be chosen until converging in the one purchased. To be more specific, on the one hand, heuristics such as recognition, inspection of attributes, weighting and adding, sufficient satisfaction and imitation, together with several extensions such as the critical mass model and the loyalty model, identify the types of inferences people make in consumption decisions. On the other hand, the division between raw and inferential preferences opens the door to visceral choices, while the distinction between elementary and final preferences underscores the decision-making process's vulnerability to last-minute influences. All this comprises a conceptual toolkit solidly rooted in the results of economic psychology. However, the model suggested is only a general framework which should be conceptually deepened and refined, as well as empirically tested in experiments related to consumer decisions. In addition, we should not lose sight of the fact that the flexibility of the model seems to run in many directions. Though not exhaustive, they include:

- The search for more heuristics and algorithms applied in consumption decisions, with special attention to their frequency of occurrence according to the nature of the act of consumption, that is, what is being purchased and the type of consumer. In this sense, it should be stressed that the consumer buying process changes depending on whether it is a routine purchase of a lower priced item or a one-off expenditure on a comparatively expensive product, or whether the choice

is between a familiar brand or a new one, or whether it involves the acquisition of a product that projects a powerful self-image or one that is invisible to outsiders, and so on and so forth.

- The detailed analysis of the uniqueness and prominence of the signals and attributes on which heuristics are based. These cues are not unrelated to the configuration of the context, which was perhaps duly modified by means of priming, framing or anchoring techniques.
- The role of memory, especially working memory, coupled with the characteristics of sensorial perception and the influence of beliefs and emotions. In any case, it is imperative to bear in mind that people tend to remember the choice and its time and place much better than why they chose what they chose.
- The model is defined in terms of static partial equilibrium. However, its dynamic version could be explored by looking at the changes that available income and lifestyle bring about in elementary preferences.

Day after day, consumers are confronted with thousands of brands and myriad consumption occasions for all kinds of goods and services. This is fertile ground for a vast range of combinations of heuristics and preferences (and beliefs, emotions and information), creating an analytical terrain that is still largely unexplored by economic theory. The model suggested here is a first step in developing the theory of consumer behaviour, drawing on the results of economic psychology.

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