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Beyond cognitive individualism: choice architectures, alimentary habits and obesity in Mexico City

Más allá del individualismo cognitivo: arquitecturas de las decisiones, hábitos alimentarios y obesidad en la Ciudad de México

Abstract | Nudges might be useful to promote changes in agents' eating habits associated with the epidemic of obesity. But they also could have some limitations. In this article, those limitations are attributed to an assumption of individualist cognition that leads to design interventions in the decision-making of isolated agents that face isolated situations. Urban obesity in Mexico City is presented as a case to show some limitations of nudging in the promotion of new eating habits. The argument is based on some qualitative studies made by some sociologists and anthropologists that address food practices in Mexico City. The case shows the necessity to adopt a rather social and situated view on cognition in the design of food policies to face obesity. Such policies should be oriented to form new eating habits by destructuring obesogenic environments. Not just focus interventions on individual decision making.

Keywords | Nudges | obesity | eating habits | obesogenic environments | obesity in Mexico City | *JLE Codes*: D90, D91, E70, I12, I18.

Resumen | Los pequeños empujones podrían ser útiles para promover cambios en los hábitos alimentarios de los agentes asociados con la epidemia de obesidad. Pero también podrían tener algunas limitaciones. En este artículo, esas limitaciones se atribuyen a un supuesto de cognición individualista que lleva a diseñar intervenciones en la toma de decisiones de agentes aislados que se enfrentan a situaciones aisladas. La obesidad urbana en la Ciudad de México se presenta como un caso para mostrar algunas limitaciones de los pequeños empujones en la promoción de nuevos hábitos alimentarios. El argumento se

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basa en algunos estudios cualitativos realizados por algunos sociólogos y antropólogos que abordan las prácticas alimentarias en la Ciudad de México. El caso muestra la necesidad de adoptar una visión más social y situada de la cognición en el diseño de políticas alimentarias para enfrentar la obesidad. Dichas políticas deben estar orientadas a formar nuevos hábitos alimentarios desestructurando los entornos obesogénicos. No solo centrar las intervenciones en la toma de decisiones individuales.
Palabras clave | Pequeños empujones | obesidad | hábitos alimentarios | entornos obesogénicos | obesidad en la Ciudad de México | *JLE Codes*: D90, D91, E70, I12, I18.

Introduction

NUDGING MIGHT BE USEFUL to address some misbehaviors involved in agents' eating decisions. Examples include displaying healthy food and hiding the unhealthy, serving smaller portions of food, or even developing graphic warnings through labeling to communicate the risks involved in eating junk food (Sunstein 2020; Thaler & Sunstein 2008; Wansink 2006). These examples are instances of what is known in the behavioral literature as nudges, in this case, applied to food choice. Nudges are alterations introduced in choice architectures to lead agents to make already pre-established decisions (Thaler & Sunstein 2008). The design of nudges usually takes advantage of agents' cognitive biases to make agents take predictable decisions (Thaler & Sunstein 2008). In this case, to promote eating healthier. However, a question arises: How and to what extent can nudges modify agents' eating habits?

There are different ways of understanding habits and many psychological (Wood & Neal 2009), and social studies (Bourdieu 2000; Crossley 2013; Hodgson 2010; Sparrow 2013) have been done in this regard. However, I follow the characterization made by the American pragmatist philosopher John Dewey to focus on the malleability of habits. For Dewey (2002, 12) "(...) all conduct is *interaction* between elements of human nature and the environment, natural and social". When these interactions are repeated in stable environments through time there is a formation of some skills and predispositions to act that form agents' behaviors. The acquisition and modification of habits are part of a complex process of socialization where "(...) the nature of habit is to be assertive, insistent, self perpetuating" (Dewey 2002, 49). But also habits involve acquired skills: "(..) Habit is an ability, an art, formed through past experience" (Dewey 2002, 52). For this reason, habits are not mere automatic and rigid repetitions. Habits are not dead. On the contrary, they are vividly adaptable cognitive tools because they are formed by social practices, but also they shape agents' attitudes, beliefs, and reasons to act (Crossley 2013; Dewey 2002). I.e. they form wills. In this way, eating habits might be understood as the outcome of agents' repeated interactions

with a social environment where they acquire some self perpetuating predispositions to eat and also some food skills that are part of their food practices. In this context, the main aim of this article is to analyze the impact of nudges in the formation of eating habits. And in this sense, I will put an analytical emphasis on two levels of Dewey's notion of habits: predispositions to act and skills learned by experience.

Considering the above elements, my claim is that while nudges can be useful in modifying some eating behaviors, they can only contribute in a limited and partial way to the modification of agents' eating habits. The reason is that the design of nudges, as we will see in section 2, assumes an individualistic assumption on cognition that erases the interaction of the agent with the environment. Such a view focuses interventions mainly on individuals' system 1 of reasoning. However, as I will show in section 3, nudges might form some predispositions to act when agents face repeatedly a choice architecture under a *ceteris paribus* condition where other variables are left aside (as the effects of multiple choice architectures, income levels, the role of urban space, etc.). But this condition, as we will see in section 4, is difficult to maintain for policymaking purposes. For this reason, in this section, I will present the case of obesity in Mexico City to show that even to form predispositions, nudges have several limitations to change eating habits of socially situated agents. Agents face a choice environment in their habitual daily life that might make nudges ineffective. To do so, I will present some eating habits of three social actors (workers, housewives, and children) that suffer from obesity and that represent a challenge for nudging. I will rely on some social qualitative studies to make the argument[1] (Delgado & Bertran 2010; Pérez-Herrera & Cruz-López 2019; Villagómez-Ornelas 2019). This case, as we will see in section 5, will demonstrate the need to move beyond cognitive individualism towards a more social approach to cognition. Where the main task of policy making should be not to make interventions on isolated individuals that face isolated situations under *ceteris paribus* conditions. But forming new eating habits by destructuring obesogenic environments. I finish the paper with some final remarks.

The individualistic view of bounded rationality, cognitive biases, and limited self-control

Behavioral Economics started as a critique to the neoclassical notion of *homo economicus*. As Herbert Simon (1955, 99) showed, this notion requires a "drastic

1 Most of these studies are written in Spanish. The translation of the quotations is mine unless otherwise is indicated.

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revision" because it assumes a notion of rationality that is impossible to meet in reality. Agents often make mistakes in their calculations, do not process all the information they have at their disposal, and can make systematic errors since they also have a fallible memory. These limited cognitive capacities prevent agents from acting according to the axioms of rational choice theory. While agents cannot optimize due to their bounded rationality, they can make good enough decisions (Simon 1955). To do these kinds of decisions, agents use their intuition to recognize clues in the environment that lead them to satisfy their aspiration levels without processing all information, and making rapid inferences (Simon 1955). Hence, the notion of heuristic reasoning is important to study how agents make decisions in the context of risk and uncertainty where agents face pressures of time and regularities are not so stable.

Simon's project of bounded rationality has been enriched by the works of psychologists Daniel Kahneman and Amos Tversky (1974) who worked on the notions of heuristics and cognitive biases. Heuristics can be understood as principles of rapid inferences that, although they are usually effective, they also tend to lead the agent to commit errors of inference that are severe, systematic, and predictable (Tversky & Kahneman 1974). That is, it leads agents to have cognitive biases. Cognitive biases are inferences that systematically deviate from the traditional rules of good reasoning: the principles of classical logic and probability (Kahneman 2003). These agents usually have different biases, highlighting the following: conjunction fallacy, the illusion of validity, insensitivity to sample size, illusory correlation, insufficient adjustment (Tversky & Kahneman 1974) of status quo (Thaler 2015), overconfidence of confirmation, cognitive illusions of control (Kahneman 2011), among many other biases.

Another element that shows that agents are not so rational is the lack of self–control, that is, the capacity of the agent to dominate his impulses, emotions, and passions. Agents often make decisions that they do not prefer or that go against their own well–being (Thaler 2015). There are situations where the agent chooses what he does not prefer or situations where emotional factors or inertial behavior prevents the agent from making a better decision. For example, if an agent is served a large amount of food in a very large container, it is likely that the agent will continue to eat despite having already eaten enough and will continue to do so until the dish is finished (Thaler 2015; Wansink 2006). Not being able to stop, in this case, is a type of inertial behavior that can be reinforced when other agents do the same as he does. The cognitive effort to resist temptations is enormous and not everyone can do it (Herman & Polivy 1983).

These contributions were later synthesized into the theory of the dual system of reasoning where heuristics, cognitive biases and the lack of self-control were integrated into the so-called system 1 of reasoning, which is a type of fast,

frugal, impulsive, passionate and automatic reasoning (Kahneman 2011; Thaler & Sunstein 2008). This system is used when a person touches a hot surface and instinctively removes his hand to avoid burning himself. System 2, on the other hand, refers to a slower, colder, analytical, and calculating system. It is used when we are solving a system of equations or solving puzzles. This system requires more time to be used, but also more consumption of energy because it requires more cognitive effort. Thinking consumes a lot of energy. For this reason, it is asserted that most people most of the time make decisions using system 1 because it is easier to use, and because it requires less cognitive energy than system 2 (Kahneman 2011; Thaler & Sunstein 2008). The implication is that agents, quite often, do not put enough attention in their decisions. They act as if they were in an automatic pilot (Thaler & Sunstein 2008) making choices that not necessarily are the best for them. As we will see in section 3, nudges are aimed at intervening in system 1 of the individual-agents' reasoning to lead them to make pre-established decisions designed by a choice architect. Nudges seeks to correct agents' misbehaviors.

However, here we can see that the dual system of reasoning assumes an individualistic view of cognition. This is the case because it is assumed that the processes involved in the decision making of agents, including heuristic reasoning, occur within the mind of individual agents (Martínez 2016; Zerubavel & Smith 2010). According to Zerubavel and Smith (2010), cognitive individualism seeks to explain cognitive processes (such as perceiving, monitoring, remembering, contextualizing, generalizing, classifying, interpreting, time recognition, etc.) only in terms of mental processes that occur within the head of individuals. This way of looking at cognition, although it has generated important advances in cognitive sciences (such as neurosciences, psychology of decision making and Behavioral Economics), has led to focus the analysis only on the isolated individual, paying insufficient attention to the interaction of agents with their social environment (Zerubavel & Smith 2010). In the case of the mentioned authors (Simon, Kahneman, Tversky, Thaler and Sunstein) the cognitive individualism implicit in their work has led to the idea that heuristic reasoning is a purely individual and mental phenomenon.

In the cognitive individualist view, the social environment plays a passive role in the process of reasoning, where its role is limited to give signals to the agent so that he can activate certain heuristics that are already given and situated in their heads. Thus, heuristics appear as something already given and fixed in the mind of individuals (Fonseca & Martínez 2017). Thus, from the individualistic perspective it is not clear how heuristics can be modified by the interaction of the agent and the social environment (Hernández Cervantes 2013). This is the case because this perspective focuses on the individual and not on the interaction between the agent and the social environment. As we will see in the next section,

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this cognitive individualism leads to design interventions (nudges) focused on isolated individuals who face isolated situations. Nudging, as we will see, is not enough to generate new habits because the role of the social environment in shaping agents' reasoning is invisibilized.

The role of nudges in forming new eating habits

Behavioral Economics has developed two key notions for policy design: choice architectures and nudges. Choice architectures are the context in which agents will make their decisions (Thaler & Sunstein 2008). These contexts are already laden because the way information is presented influences the agents' perception of the different options in a situation and leads them to choose a particular one in a predictable manner (Thaler & Sunstein 2008). Choice architectures are not neutral because they appeal to the agent's cognitive biases and illusions. All the details in displaying information matter.

Nudges are alterations introduced in choice architectures that lead agents to make decisions already pre-established by a designer, a choice architect who organizes the context where agents will make their decisions (Thaler & Sunstein 2008). The alterations introduced in these architectures are cheap, easy to remove, and do not alter the incentive systems of a situation. Nudges are not prohibitions, banns, or alterations in rewards and punishment systems (incentives). Nudges do not increase taxes or the costs of choosing an option (Thaler & Sunstein 2008). The design of nudges take advantage of all the knowledge available about heuristic reasoning, cognitive biases, and other cognitive processes that are part of system 1 (Thaler & Sunstein 2008). The following types of choice architecture are usually used for the design of nudges:

- default rules: default options that are activated when an agent does not make a decision in a limited period of time;
- graphic warnings: that communicate risks in a visual way, or that through optical illusions generate already expected behaviors;
- framing effects: the same information might be presented to agents in different frames, but the way in which it is framed alters decisions;
- priming effects: some ex–ante information might predispose agents to make a decision;
- social nudges: these are interventions aimed at influencing the behavior of an agent, through other agents, appealing to the imitation of what other people do, reputation effect (agents often care about the perception other agents have about them), rumors and narratives, and perception of social norms.

As choice architectures are inevitable (all the time we are facing choice situations where different options are presented in an already biased manner by different factors), it is assumed that agents, having cognitive biases, limited self-control and limitations in their learning capacity, are placed in a situation of vulnerability. In this context, a notion of libertarian paternalism is defended (Sunstein & Thaler 2003; Thaler & Sunstein 2008) where governments should be paternalistic in the sense of protecting agents both from themselves and from the depredation of other agents (Thaler & Sunstein 2008). Therefore, choice architectures should be regulated, and nudges should be designed to promote greater social welfare in the citizens. For this reason, the government should have a more active and interventionist role than the one portrayed by the libertarian approaches. But is still libertarian because the use of nudges respect freedom of choice. Governments, through the use of nudges, will not dictate to agents what to do and how to live their lives. Libertarian paternalism is a soft (not hard) paternalism, oriented to means, not ends (Sunstein 2014), where it is assumed that nudges are means to help agents to achieve their own welfare goals "(...) as judged by themselves" (Sunstein 2016, 92).

In the case of food choice, some nudges have been proposed to help agents to achieve their objectives of well being. I.e. to eat healthy to avoid obesity and cardiovascular diseases (like diabetes) associated with it. Nudges, in this case, help agents to not succumb to their lack of self–control, the present bias and other inertial behaviors (Loewenstein & Chater 2017; Oliver & Ubel 2014; Wansink 2006).

In the behavioral literature applied to food choice, default rules have been proposed that seek to regulate the size of portions offered in markets (Thaler & Sunstein 2008). This issue is particularly important because for decades the food industry has increased the size of food portions offered to consumers. And since consumers do not have enough self–control, they consume all the portions offered to them in the market even though they have already satiated their appetite. Graphic warnings have also been proposed (Sunstein 2016), in particular, new labeling that seeks to communicate quickly to consumers the risks of consuming certain foods that have excessive fat, sugars, and carbohydrates (Sunstein 2016 y 2020).

Other examples of food nudges are those that take advantage of the framing and predisposition effects where one seeks to put healthy food in view and unhealthy food out of sight (Thaler & Sunstein 2008). In fact, it has already been applied in some cafeterias in the United States, where experiments showed a 25% increase in salad consumption. The option of avoiding the deployment of sweets and candies in stores to reduce consumption is currently being studied in the United Kingdom (Department of Health & Social Care 2020). It has also been proposed to regulate the exposure time of commercials that promote junk food (De-

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partment of Health & Social Care 2020). In the United Kingdom, it is proposed that such commercials can be transmitted only from 9 pm when the rating of viewers is reduced (Department of Health & Social Care 2020). This measure seeks to reduce the propaganda in favor of junk food so that fewer people are exposed to such marketing.

All of these nudges are not coercive, nor are prohibitive, nor do they alter incentive structures because they do not increase the economic costs of eating unhealthy food. The option of eating unhealthy food is left open, but nudges are introduced to softly drive agents to eat healthier.

These policies could have a positive impact on agents' food decisions. But, as some behavioral scholars (Loewenstein & Chater 2017; Oliver & Ubel 2014) have claimed, nudges are not enough to reduce obesity. A number of different variables play a role, such as budget constraint, food insecurity, the institutional regulation of food market and agents' customs. Hence, a solution to obesity is not reducible to the mere implementations of nudges. For this reason, it is very important to highlight the importance of the formation of agents' habits and evaluate how nudges might impact them.

Food nudges might partially alter habits through the formation of some predispositions to act only when an agent faces a choice architecture in a durable and stable manner, considering a *ceteris paribus* condition. For example, a child that does not see junk food in the school during years may not develop a taste for junk food while in the cafeterias only salads are displayed. This might be the case under the assumption that there are no other choice architectures outside of school that do not counteract the effects of this nudge. But this assumption is not realistic or sounded when we consider agents socially situated, as we will see in section 4.

The same story might apply to the nudge of reducing the portion of food size. If agents received this nudge in a stable and durable manner, considering a *ceteris paribus* condition leaving aside other variables, they might adapt their eating to reduce their consumption of food. Then, they will be habitualized to consume a lesser portion of food. But this agent's habituation requires a time of adaptation (Bourdieu 2000; Dewey 2002; Hodgson 2010). The formation of habits is not an automatic process.

Nudges, in this sense, might form predispositions to act under a *ceteris paribus* condition. But *ceteris paribus* clausules, while might be useful for methodological research purposes, are problematic for the design of public policies (Cartwright & Hardie 2012; Colander & Kupers 2016; Hortal 2020). Nudges (and other policy interventions) might be analyzed in labs under ideal and controlled conditions that, not necessarily represent robust evidence that guarantee that the nudges that worked in labs will work in socially situated environments. As Hortal (2020, 16-17)

put it, "(...) Treating human rationality as a black box and establishing nudges by testing their outcomes while disregarding expressive or social reasons for behavior, all while defining non–normative behavior as irrational, can make nudges ineffective." Adding the role of values, i.e. axiological rationality, might shed some light in understanding the reasons and motives that drive agents to act as they do (Bicchieri 2017; Echeverria & Alvarez 2008; Hortal 2019, 2020). For this reason, it is important to realize that agents' rationality and behavior is socially formed (Bourdieu 2000; Dewey 2002). As we will see in the next section, social factors matter in understanding why socially situated agents behave and eat as they do.

Nudges and socially situated agents: The case of obesity in Mexico City

In the last section, we have mentioned a number of nudges that can be applied for the modification of agents' eating behaviors. However, it is not clear how and to what extent these nudges may modify their eating habits. In particular, in socially situated agents where they have daily life routines conditioned by their social conditions. Not under a *ceteris paribus* condition.

In what follows I will present some habitual situations that workers, housewives, and children who suffer from obesity face in Mexico City. I will pick up some qualitative sociological and anthropological studies (Villagómez-Ornelas 2018; Peña and Bacalao 2000) to show how a number of social factors (urban poverty, inequality, and social norms) are closely interconnected forming obesogenic environments. Such environments reproduce obesity as a social issue. Also, I will contextualize the situation with some empirical data from the National Health and Nutrition Survey (ENSANUT by the sigles in Spanish), 2018, to make the argument clearer.

Obesity among workers

According to ENSANUT (2018) practically half of the population of Baja California and Quintana Roo suffer from obesity (48%). Baja California Sur, Colima, Nuevo León, Sonora, Tamaulipas, Tabasco and Yucatán are above 40%. In the case of Mexico City, it is estimated that 36% of the population suffers from obesity, practically at the same level as Coahuila (37.6%), Durango (37.5), Nayarit (36.9), which is the national average.

Workers (both women and men) that inhabit Mexico City usually have to spend quite a lot of time in public transport given the size of this megacity. In Mexico City, the average inhabitant spends about 88 minutes a day on their transportation time, but little more than 30% of the population spends more than two hours a day. However, it is quite common that many people spend an aver-

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age of 4 hours per day on transportation from home to work and vice versa. This is the case of a woman who, according to Lucía Mejía-Dorantes (2018, 108) expose her daily life situation "(...) It takes me 1.5–2 h a day from home to my workplace in the morning and 2 h on my way back (working six days per week). I take a bus (long distance bus with discrete stops) and then the BRT line". In this context, eating in the street has become a common social practice in this City. As Delgado and Bertran described:

> (...) eating in the street has been a common activity in Mexican society since pre–Hispanic times and has spread parallel to urban expansion. In other words, we are facing the expansion of a cultural trait that has been exacerbated by socio–economic conditions (Delgado & Bertran 2010, 50).

By socio–economic conditions, these authors mean, besides the urban expansion, the drop in real wages, the proliferation of fast food in the market (Santos Baca 2014), and the lack of time for cooking healthy food given the transportation and labor conditions of workers. A worker usually eats junk food in the street because it is affordable given their limited budget constraint and lack of time. But here there is another motivation for workers to eat this kind of food in the streets: to fill or fool the stomach (Aguirre 2000, 15). Workers usually want to obtain energy fastly to avoid physical exhaustion both at work and during transportation time. It is quite common that, after working, a worker is exhausted and during his way back home he consumes junk food (like sugar beverages, industrial bread, and candies).

In workers' food choices, the perception of risk is only focused to avoid infections generated by the lack of hygienic conditions in a local. It is not often considered the risk of suffering obesity in the long–term or other chronic diseases (Delgado & Bertran 2010, 48). And it seems that the main criteria to choose street food is what is affordable to full stomach and obtain energy. After working 10 hours a day and spending 4 hours in transportation, a person usually gets cognitively loaded because the brain gets exhausted after processing a large amount of information. And when this happens, the person easily succumbs to the lack of self–control, eating junk food that is displayed in public spaces and that he knows he should not be eating. But he does. We talk about cognitive load, and not just hunger (a physiological process) to emphasize on how a decision was made and not in the cause of his decisions. A hungry person chooses eating food to satisfy his physiological necesity, but the how he choose might be in a consciously manner, prioritizing the quality of the food to keep a good health, or unconsciously, in a fast manner, prioritizing simply filling the stomach to obtain energy.

According to Shamah-Levy *et al.* (2019, 852) "Obesity is more prevalent in populations in conditions of vulnerability due to the coexistence of factors such as unemployment, high availability of foods with low nutritional content, low level of food security and lower access to health services". For the specific case of Mexico, according to their quantitative analysis of ENSANUT 2018 statistics, for populations with less than one hundred thousand inhabitants, they found that obesity in adults, divided into those with many deprivations, medium deprivations and few deprivations (considering housing characteristics and household goods) was, in 2018, 38.4, 39.1 and 38.4 respectively (Shama Levy *et al.* 2019, 861-862). This implies that obesity is slightly more prevalent in households with average deprivation, but, as the authors themselves highlight: "(...) there is a high prevalence of obesity even in the poorest and most vulnerable sectors of the Mexican population, where it also seems to increase and catch up with the rest of the population rapidly but with significant structural disadvantages." (Shama Levy *et al.* 2019, 864). For this reason, we might suggest that obesity, in Mexico, involves a social class issue where inequality contributes to reproducing unhealthy eating habits among workers and may aggravate the consequences of the obesity epidemic among the poorest sectors of the population because they are the most vulnerable.

Obesity among housewives

Mexican women are more vulnerable to obesity than men. In Mexico, according to data of the World Health Organization (2020),[2] in 2016 the proportion of obese people was 24.3 among men and 32.8 among women. However, the data reported by ENSANUT (2018) gives us an even more serious idea of this situation, as it is reported that the proportion of women aged twenty or older who had obesity rose from 37.5 in 2012 to 40.2 in 2018, which is higher with respect to men, who went from 26.8 in 2012 to 30.5 in 2018. This is a very significant gender gap that requires analysis. In Mexico many households still maintain traditional gender roles, where women stay home to do domestic work, while men go out to work. This situation leads Mexican adult women to adopt more sedentary lifestyles than adult men.

But here some choice architectures embedded in social norms might lead women to eat in excess. A qualitative social study of food experiences shows a case of a woman (named in the study as Irma) who has morbid obesity. This woman:

> (...) spends most of her time in the kitchen which is also the living room and foyer. Everyone passes through there, residents and visitors, and Irma is always there, coo-

2 Source consulted in August 2020.

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> king, listening to the radio, washing clothes or dishes, talking to the neighbors who visit her or with their own family members. Given her almost permanent presence in this space, Irma accompanies meals of her family members as they leave or arrive, at different times. This accompaniment often includes eating with them, even if it is not a fit meal, just "a taco", a little bit with each one. This practice, the natural and even forced "picketing" in terms of cohabitation, contributes to her perception that she eats little, although a little with everyone ends up being a lot. (Villagomez-Ornelas 2019, 279)

As we can see, the choice architecture that Irma faces here day after day is socially situated and closely linked to some gender social norms (Bicchieri 2017). Such social norms assign women a role as housewives that tends to reproduce an unhealthy alimentary practice for women. In this case, the woman assumes that she has to go along with each member of the family while they eat, eating with them too. And, this social practice leads women, like Irma, to eat in excess because it is what other women do in terms of cohabitation. And morbid obesity is slowly structured, little by little, as if it were a slippery slope, where, at the end of the day, the person that suffers from obesity does not know the why of her suffering. It is a habit, a custom that is reproduced in daily life. In this sense, we might say that there is some gender biased social norms (Aguirre 2000; Bicchieri 2017; Villagómez-Ornelas 2019) that should be taken into account when policymakers design behavioral interventions because the case of Irma is not an isolated case.

Child obesity

Mexico is the country with the most prevalence of child obesity in the world. Besides some genetic predispositions, there are some social factors that explain child obesity (Pérez-Herrera & Cruz-López 2019). Children often consume junk food offered by vendors outside schools. Or at home, because family members (parents, siblings, grandparents, aunts and uncles, and cousins), neighbors, or friends offer them junk food as part of daily life and cohabitation (Pérez-Herrera & Cruz-López 2019). In a context where children tend to have an increasingly sedentary lifestyle. Children usually play video games, use computers, tablets, watch TV, but there is a tendency of not doing physical activities associated with sports (Pérez-Herrera & Cruz-López 2019). The quantity of calories habitually consumed by a child is not expended by him in physical activity.

The situation is even worse if we consider that in many families, both parents work. And given the length of the working day and the issues of transportation time of Mexico City, parents spend much of the day away from home. In this context, the time they can spend supervising the feeding of their children is increasingly limited. When children are left alone the risk is that they will end up eating

high amounts of junk food (Pérez-Herrera & Cruz-López 2019). In some cases, this trend is even worse when we consider that some parents have naturalized obesity. If the parents are obesse, it is highly probable that their children will suffer from obesity too because some parents have naturalized obesity and often think that nothing can be done about it.

As we saw in this section, there are some misbehaviors related to obesity that socially situated agents reproduce in their daily lives. Such misbehaviors are eating repeatedly junk food in the street, eating in excess but little by little at home in terms of cohabitation, children sedentary lifestyles, the lack of parental supervision of children feeding and, the naturalization of obesity of some parents. These unhealthy habits are not just a matter of wrong informational structure in an environment, or a kind of irrationality that generates poor individual decisions. It has to do with the social structure of the environment where changes in the market food, social inequalities, low incomes, gender–biased social norms, and issues of urbanization contribute to shape agents' unhealthy eating habits and sedentary lifestyles. For this reason, it is important to go beyond cognitive individualism to embrace a more social approach where the role of the social environment should be characterized as more active in the structuration of agents' reasoning and behavior. I will further elaborate this idea in the next section.

Nudging, habits, and obesogenic environments

There are some social environments that reproduce more obesity than others. Such environments are named obesogenic because their constitution pushes agents to eat unhealthily and to assume sedentary lifestyles. Far from individual factors (such as genetic levels or individual decision making), the notion of obesogenic environments highlights the role that environmental factors play in the development of obesity (Kirk *et al.* 2010).

Although there is not a consensus of what precise components an obesogenic environment has, some systematic reviews claim that these kinds of environments involve a number of different variables situated at different levels of organization (Kirk *et al.* 2010). Such levels go from physical conditions (such as urbanization, transportation, automobile use), economic conditions (such as income level, food insecurity, market food structure), political conditions (such as regulation of institutions, conflict of interests), and a socio–cultural level (related to customs and social norms) (Kirk *et al.* 2010). All these levels have different impacts on agents' physical activity and diets and should be addressed as a whole.

In section 4, we have enumerated some variables that refers to physical space (the transportation issues of Mexico City), economic level (like changes in

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the food market and the fall of real wages) and, sociocultural variables (like gender–biased social norms and the custom of eating in street). Also, some political factors played a role, especially the pressure exerted by the food industry to avoid regulations and new labels (Martínez-Espinosa 2017; Santos Baca 2014). In this context, we might say that in Mexico City there is an obesogenic environment consolidated (Martínez-Espinosa 2017) where a number of physical, economic, political and sociocultural variables play a role in the reproduction of obesity at social scale. Food decision-making here is socially situated, and the patterns of behaviors are lock–in given the conditions agents face in this obesogenic environment.

Then, what is the task of health policymakers? In this context, we may recall some of John Dewey's words: "(...) We cannot change habit directly: that notion is magic. But we can change it indirectly by modifying conditions, by an intelligent selecting and weighting of the objects which engage attention and which influence the fulfillment of desires" (Dewey 2002, 20). In this sense, we might see nudges as complementary to other policy tools such as incentives, banns, mandatories, educational boosts, and institutional regulations (Loewenstein & Chater 2017; Oliver & Ubel 2014) that might seek to modify the conditions that reproduce obesity. I.e to modify eating habits by destructuring obesogenic environments. Considering the cases exposed in section 4, we might say that to destructure Mexico City's obesogenic environment it is required:

- reducing the length of the working day and improving the transport system to give workers more time for preparing healthy food and parents more time to supervise the feeding of their children.
- regulate the deployment of choice architectures in public spaces like street, transport, schools, and workplaces where junk food is offered. This is especially relevant, because in the public spaces of Mexico City (streets, in the entrance of public transport, in the transport like subway or buses, in public places, etc.) all the time junk food is offered by informal sales carts at a very low price. We know that choice architectures have been used in the food industry to promote the consumption of junk food by using cognitive biases against the agent's welfare. Such use of choice architectures is labelled by Thaler (2018) as "sludges", which he defines as "nudges for evil" and consists of the abusive use of choice architectures by a sector of the population to promote their own welfare to the detriment of others. Sludges would therefore have to be regulated, which implies assuming the need to promote more public action by the government, assuming that there will be resistance from the large food industries because they will see a threat to their profits. This is a

governance issue that will have to be worked out between government, civil society and the food industry in the future.
- increase the real wage of workers so that they can have access to food of better nutritional quality (Penne & Goedemé 2020);
- ban certain food produced with substances harmful to the body (Levasseur 2020)
- to introduce changes in social norms to avoid the reproduction of gender roles that put women in a high vulnerability situation of suffering obesity
- to introduce educational boosts (Grüne-Yanoff & Hertwig 2016; Hertwig 2017; Hertwig & Ryall 2016) to raise nutritional education in agents.

This list is not exhaustive. It just points out some variables that should be addressed to change agents' eating habits in Mexico City. In the long term, it will be necessary to think about changing the current model of urbanization (not just in Mexico City, but in different parts of the world) because there is a level of reproduction of urban poverty which, in turn, is closely correlated with obesity.

In this context, resuming a dialogue with the social practices approach could be useful to enrich our understanding of how socially differentiated eating behavior patterns are structured. In particular, Bourdieu's (2000) notion of *habitus* may be relevant to study obesogenic eating practices to highlight how predispositions to act socially differentiated are formed according to the economic, cultural, social and symbolic resources available in each space of socialization of the agents. In the case of obesity, there have already been some studies (Martínez *et al.* 2020) that address the food practices of the agents through the concept of *biohabitus* to highlight the conjunction of different sociobiological processes that structure bodies with socially differentiated health, where the sectors that have more economic and cultural-educative resources are in better conditions of possibility to form healthier food practices than those sectors that are more disadvantaged. For this reason it becomes relevant to deepen the analysis on the connections that may exist between the concepts of *habitus*, heuristic reasoning and cognitive biases (Hernández Cervantes 2013) in order to better understand how certain agents' reasoning is formed which, when situated in social practices, may lead agents to adopt and reproduce socially differentiated alimentary habits in social spaces characterized by great economic and social inequality (Martínez *et al.* 2020). This results in a move away from the cognitive individualism criticized in this article which lead us towards a more social perspective of cognition (Martínez 2016; Zerubavel & Smith 2010).

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Final remarks

Nudging might be useful to address obesity. But, as we saw in this article, nudges are not enough to form new eating habits. To form new eating habits we need to move beyond cognitive individualism to embrace a more social and ecological approach to cognition. And this might be achieved by taking up the concept of habits and assigning a more active role to the social environment in the formation of heuristic reasoning and agents' behaviors. However, any policy design should seriously consider the social condition of agents in order to design more effective public policies. It is important to say that *ceteris paribus* assumptions are useful to analyze in labs and in abstract models some behaviors. But the actual agents' behaviors *in situ* are much more complex because a number of variables are involved in the structuration of habits. What is more: some choice architectures, as we saw in the case of obesity in Mexico City, are embedded in some social factors like social norms, urban space, economic and political variables that, as a whole, form obesogenic environments. The implication, then, is that the target of behavioral food policies should not be the individual decision making, but the promotion of changes in agents' eating habits by the introduction of policies that should be oriented to destructure obesogenic environments. And, to do so, we should highlight the complementarity of nudges with incentives, educational boosting, better urban planning, labor and wage policies, etc. All that matters for destructure obesogenic environments. More research should be done on the topic of how different inequalities (of class, race, and gender) contribute to shaping obesogenic environments and how such environments reproduce socially differentiated eating habits in different social groups both in developed and in developing countries.

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