

## Cooking autonomy: a multilevel conceptual model on healthy home cooking

Autonomia culinária: um modelo conceitual multinível de culinária doméstica saudável

Autonomía culinaria: un modelo multinivel conceptual sobre cocinar sano en el hogar

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### Abstract

*The empowerment of home cooking has been recently approached in the literature as pertaining to cooking skills and the capacity to overcome social, physical, and economic obstacles. However, thus far no studies have related the State's role in this important health-promoting home practice, namely healthy cooking. We aim to elaborate on the concept and develop a multilevel conceptual model of cooking autonomy (CMCA) in order to relate the State's role in healthy home cooking. This is a theoretical-conceptual study consisting of three phases: conceptual elaboration, expert panel consultation, and content validity of the CMCA developed in this study. A comprehensive literature review worked as the theoretical and conceptual basis, featuring Amartya Sen's human capability approach. A total of 28 experts issued their opinions in listening workshops and interviews. Cooking autonomy was defined as the capacity to think, to decide, and to act to prepare meals from scratch, influenced by interpersonal relations, environment, cultural values, access to opportunities, and guarantee of rights. The CMCA has six levels, differing according to the degree of participation of an individual. We also present two charts with examples of the agent's practices and actions that can be developed by the State in the public policy sphere. As a pioneering model in the international literature, the CMCA provides the conceptual basis for the development of studies and interventions on cooking autonomy, focusing not only on individual skills, but also on the role of public policies for healthy home cooking.*

*Cooking; Personal Autonomy; Aptitude; Models Theoretical; Policy*

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## Introduction

Healthy cooking – which consists of preparing meals using mostly unprocessed or minimally processed foods and culinary ingredients, such as salt, sugar, oils, and fats <sup>1,2</sup> – has been increasingly gaining ground within the guidelines for healthy eating habits. Recent studies have related home cooking to a better diet quality <sup>3,4,5,6,7,8,9</sup> and lower consumption of ultra-processed foods <sup>7</sup>, which are widely associated with the prevalence of overweight and obesity, diabetes, and hypertension, as well as with the risk of cancer <sup>8</sup>.

Despite its known strategic role in health promotion, home cooking is a complex practice, since *“cooking is not merely a matter of mechanical skill”* <sup>10</sup> (p. 297). In a systematic review of 38 articles on health and social determinants and outcomes of home cooking, Mills et al. <sup>11</sup> found that gender, available time, employment, family support network, culture, and ethnicity are key determinants of cooking practice. The putative outcomes analyzed were mostly at the individual level and focused on potential dietary benefits. In another review, McGowan et al. <sup>12</sup> observed that a large share of the studies analyzes cooking as a skill centered on know-how, that is, on technical aspects related to the moment of preparing meals.

The findings by Kesteren & Evans <sup>13</sup> extend beyond the concept of cooking as a person-centered task; they used an in-depth qualitative approach with 25 mothers (including interviews and cooking observations) and a quantitative survey of 310 respondents in England. The authors found that *“social deprivation can impact upon the materials, meanings, and competencies of cooking practices in ways that severely limit the capacity for those in more deprived areas to frequently cook with healthier unprocessed ingredients”* <sup>13</sup> (p. 1).

However, no studies have related (in addition to individual skills) the actions that can be developed in the sphere of public policies for the promotion and strengthening of home cooking. By focusing on the State’s role, we aim to enhance the discussion of this relevant public health subject, which has already proven too complex to be treated exclusively from an individual perspective <sup>10,11,13,14</sup>. The objectives of our study are to elaborate the concept and to develop a multilevel conceptual model of cooking autonomy (CMCA) that considers the individual as the protagonist in cooking decisions and includes the State’s responsibility in this significant health-promoting practice.

## Methodology

This is a conceptual study with the following stages: a narrative literature review, conducted by searching the keywords “cooking autonomy”, “culinary”, “home cooking”, “domestic cooking practices”, “cooking skills”, “ecological theory”, “agency”, and “capability approach” in international databases; mapping of concepts related to cooking autonomy, and elaborating the CMCA and charts with examples of components and actions developed in the policy-making sphere.

The construction of conceptual models, i.e., graphic schemes, is recommended to organize the theory of a new concept, to support the construction of measurement instruments and to guide studies and interventions aimed at a particular subject <sup>15</sup>.

## Theoretical and conceptual basis

Frances Short <sup>16,17</sup> was the author chosen as the main bibliographic reference on this subject since she presents cooking as a set of skills that extend beyond the preparation phase, including planning and creativity, in addition to conceiving skills that focus on the individual and not on the meal preparation.

Another cornerstone in cooking autonomy was the concept of autonomy in the capability approach, thoroughly discussed by Amartya Sen <sup>18</sup> as the notion of “agency”. One of the central ideas of the capability approach is that people have different skills to convert resources into functions (that the individual manages to do or to be). Conversion factors may be personal (physical condition, skills, intelligence), social (power relations related to class, gender, race), and environmental (natural or built environment in which the person lives) <sup>19</sup>.

Agency was another significant concept, both from the point of view of Human Sciences<sup>18,20</sup>, and that of its application to cooking<sup>10,14</sup> and to eating as an “essential dimension of food security”<sup>21</sup> (p. 24). An agent is anyone that changes the environment with their free and rational action<sup>20,22,23</sup>. In the field of eating habits, the term “food agency”, represents the capacity of a person who cooks at home to perform cooking through a dynamic process ranging from planning to the consumption of meals, not limited to isolated technical performances<sup>10</sup>.

In Human Sciences, the notion of “autonomy” is broader and more complex, defined as an agents’ power to achieve their objectives, according to their own properties and limitations, not imposed by external conditions, highlighting the State’s role in guaranteeing individual rights<sup>18,23</sup>. To be autonomous entails two essential conditions, to have internal resources to act as protagonist according to one’s wishes<sup>24</sup> and to be exposed to a favorable environment for one’s free action<sup>18</sup>.

An additional theoretical reference was the *Dietary Guidelines for the Brazilian Population* published in 2014<sup>1,2</sup>. This document orients public policies for healthy food, with internationally acknowledged value<sup>25,26</sup>, and addresses cooking and skills involved in preparing meals from unprocessed or minimally processed foods and cooking ingredients, as emancipatory skills and practices for the promotion of adequate and healthy food on an individual and collective level.

The model is based on the concepts drew on Urie Bronfenbrenner’s Ecological Systems Theory (an ecological approach)<sup>27,28</sup>, which presents five systems that involve the individual and model their behavior: the microsystem (the basic core in which the individual develops); the mesosystem (the links between the microsystems); the exosystem (the contexts that influence the microsystems, such as public policies); the macrosystem (a society’s cultural and political values, economic models, and social conditions); and the chronosystem (the historical moment in which the individual lives)<sup>28,29</sup>.

### **Expert consultation**

In 2018, two workshops at the State University of Rio de Janeiro in 2018 and several individual consultations were carried out to enhance the knowledge on some specific topics and to listen to foreigners, until reaching the final version of the model. These activities involved 28 experts: 25 were professors and researchers from 15 universities in Brazil (n = 12), Canada (n = 1), Netherlands (n = 1), and Northern Ireland (n = 1). Other participants included two nutritionists and a lawyer working in Brazilian social movements connected to the food and nutrition agenda, as well as a regional advisor on nutrition from an international public health agency. Among these experts, 25 were women, so the inputs have a predominantly female perspective, corroborating other studies on the same subject that were included in the review by Mills et al.<sup>11</sup>.

### **Content validity**

Content validity was assessed with a qualitative (commentary and discussion) and a quantitative procedure (content validity ratio – CVR)<sup>15</sup>. We assembled a panel of experts who had already been consulted in the prior stage. Each expert received an online form with a list of the CMCA components and assessed each item on a four-point scale, where 4 = “highly relevant” and 1 = “not relevant”.

Each item CVR was obtained by using the following equation:  $CVR = (ne - N/2)/(N/2)$ , in which “ne” is the number of experts that classified each item as “essential” (4 or 3), and “N” is the total number of respondents. The CVR varies from -1 to +1, in which 0 means that half of the panel consider the item essential. To ensure that the result is not due to chance, for 10 evaluators (the number of experts participating in this phase of the study), Lawshe<sup>30</sup> recommended a cutoff of 0.62 for considering an item essential. Items that reached values below this were ruled out. As for the qualitative procedure, the document that was sent had a space for comments. After this stage, the final versions of the model and charts were produced.

## Results

### Conceptual model of cooking autonomy (CMCA)

The activities developed to achieve the study objective produced a multilevel conceptual model of cooking autonomy, i.e., a graphic scheme used to organize the concept that expresses the necessary components to develop cooking autonomy according to the principles of ecological perspective<sup>27,28</sup>. In the CMCA, agents at multiple levels contribute to the development of autonomy, and the influences interact between the levels (Figure 1).

Figure 1 shows the agent's circle in moss green to represent the intersection of the other colors, which result in the most saturated or pigmented color, and thus a synthesis-color. This technique was chosen to express the idea that individuals who act are a result of everything to which they are exposed (other levels). However, the logic of circles would not be adequate for representing cooking autonomy, which is the product of this interaction between the individual's characteristics, i.e., a distinct event that is the outcome of a process. In the model, cooking autonomy takes the shape of a red hexagon, thus a different shape and color from those used in the levels.

As an alternative to the chronosystem traditional representation, usually expressed as an outer circle in the model<sup>31</sup> or as an arrow pointed to the right and positioned below the central figure<sup>32</sup>, this model innovates by depicting the chronosystem as a spiral in order to communicate two important messages in the figure: the environmental events and transitions that occur over time permeate and influence all levels; and what happens in the social and historical moment in which one lives is fluid, mutable, malleable, and nonlinear or non-unidirectional, like an arrow. By permeating the levels, the chronosystem can influence the development of autonomy, highlighting an ecological system interdependence<sup>27,28</sup>.

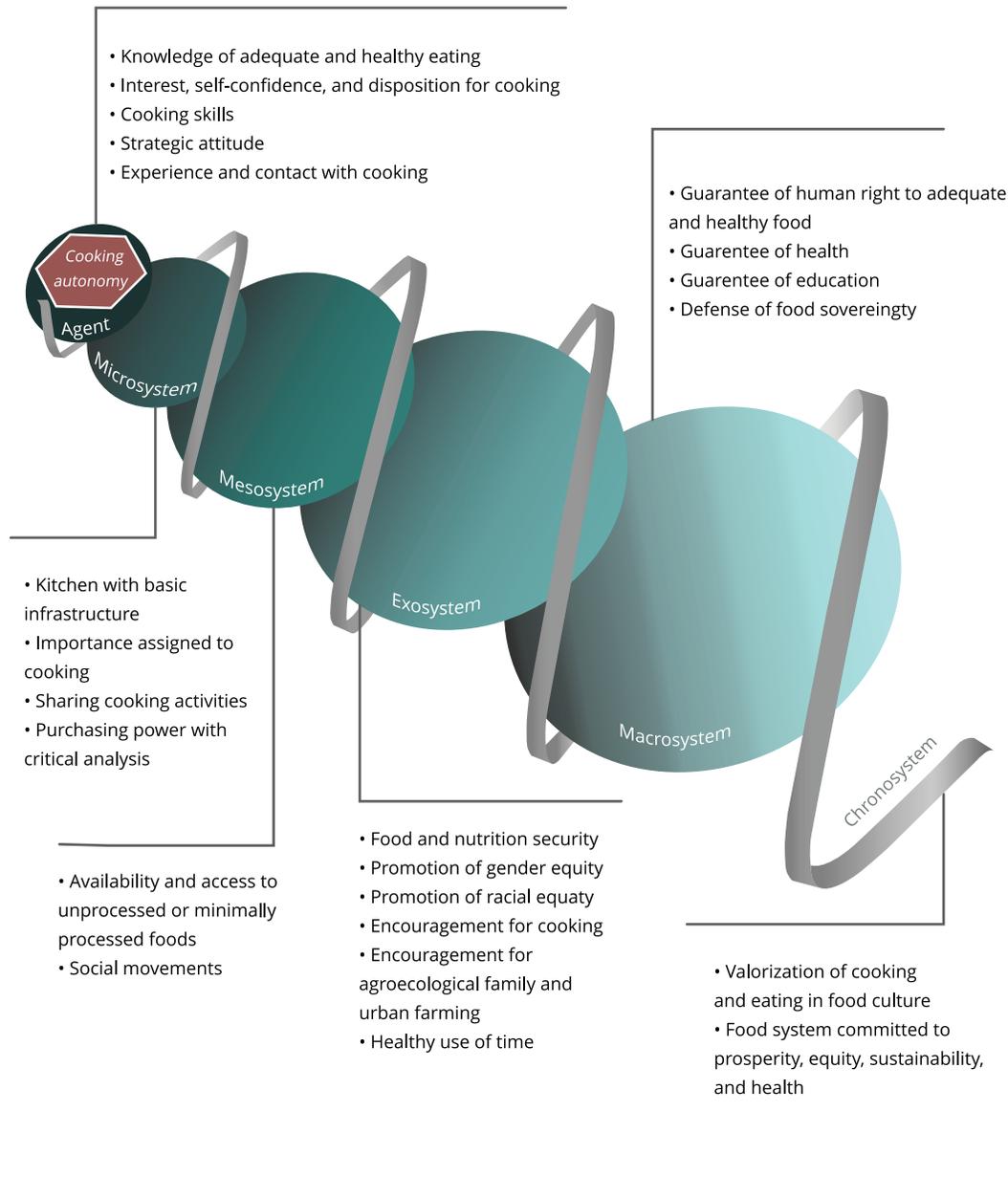
The food system proposed (based on the work by Mozaffarian et al.<sup>33</sup> and Swinburn et al.<sup>34</sup>) within the CMCA embodies "qualities that support the six dimensions of food security"<sup>21</sup> (p. 11) (availability, access, utilization, stability, agency, and sustainability), which are necessary to achieve the right to food. The proposed food system opposes the hegemonic food system, shaped by capitalism, founded on competition and on women's oppression and exploitation, highly dependent on large corporations that do not aim at women's autonomy and people's quality of life, but at the maximization of short-term profits<sup>35,36,37,38</sup>. The strategy used for the maintenance of this hegemonic system is to keep people dependent on ultra-processed foods and alienate them from daily cooking tasks that could strengthen local food culture. The chronosystem thus presents components that relate to an economic and social system based on justice, equality, and solidarity, that cooperate for human emancipation in the sense of freedom discussed by Sen<sup>18,39</sup> and Davis<sup>40</sup>. Thus, when addressing autonomy, it is necessary to consider capitalism influence on the processes of interpersonal discrimination and segregation.

The macrosystem includes the guarantee of the "human right to adequate and healthy food" ("Food and nutritional security consists in upholding the right to regular, permanent, and unrestricted access to quality food, in sufficient quantity, without compromising the access to other essential needs, based on health-promoting food practices that respect cultural diversity and are environmentally, culturally, economically, and socially sustainable" – free translation)<sup>41</sup>, which is considered necessary for the development of cooking autonomy. The same is true for the guarantee of "food sovereignty", which "is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems"<sup>35</sup>. Also related to the empowerment in meal preparation is the guarantee to health and education, important foundations for decision-making based on critical reflection, essential for the development of autonomy.

The exosystem includes "social well-being", which is the comprehensive set of actions taken by the public management and society, targeted to ensuring rights in health, welfare, and social assistance<sup>42</sup>; it deals with something intrinsically bound to the achievement of fundamental rights, which are the "existential minimum". The aim of including this component in the conceptual model is to show that an individual develops their cooking autonomy, having the guarantee of physical survival as well as the development of their overall personality. Just as living is not only surviving; eating is not only about ingesting nutrients. Regardless of cooking autonomy being an individual process –

**Figure 1**

Conceptual model of cooking autonomy.



the concept of autonomy is related to the individual and not to the collective<sup>43</sup> – it cannot be experienced only to ensure existence (the guarantee of human life), instead it should be aimed toward a healthy and decent life, one with dignity<sup>44</sup>.

Other components in which the State plays an essential protective role are “food and nutrition security,” which consists of universal guarantee of “*access to quality food, in sufficient quantity, without compromising the access to other essential needs*”<sup>41</sup> the promotion of gender equity and racial equality, through actions to promote equal treatment between men and women of all races to minimize the inequalities that structure relations, and the “healthy use of time”, in the sense of promoting the conditions for individuals to manage their time in such a way as to preserve their health (build intimate

personal relations, exercise citizenship, work, play, care, and rest) <sup>45</sup>. Time for cooking is also necessary, since the lack of time is one of the main reasons people forgo healthy foods <sup>46,47</sup>. No matter how extensive one's cooking skills is, cooking requires time, and different foods have specific cooking times. According to Strazdins et al. <sup>48,49</sup>, the failure to consider time as an important element in health guidelines is "politically unpalatable", since it is unthinkable to suggest interventions and actions that demand more time precisely from the population that most needs it, for example, to suggest that people cook more without taking measures to support them in doing so.

Also, the State should promote and support health actions, such as cooperating with healthy cooking through "incentives for cooking" and "incentives for family and urban agroecological farming". Encouraging the use of foods from a sustainable cultivation of the land, done by small family-based farms, in which the processes and distribution of foods is managed by family members in short food supply circuits, positively influences the development of cooking autonomy.

In the capability approach, the macro and exosystem levels express resources that make the individual's action possible (i.e., "guarantee of health" and "food and nutrition security"), providing the conditions for decision-making, contrary to when the State is absent or coercive, which ends up inhibiting human action. Thus, access to reliable health information is important for food and nutrition security. Food and nutrition education becomes central in this context: by using cooking as a method for teaching and learning, abstract concepts in nutrition and health materialize. The subject's knowledge and past experiences are brought to the surface, situating participants as protagonists in this educational process and also allowing for an experience that mixes rational and sensorial aspects, mobilizing individuals for transformation <sup>50</sup>. However, educational initiatives in cooking and the promotion of healthy eating will have a limited effect if they fail to consider the structural issues identified at these levels.

The mesosystem includes "availability and access to unprocessed or minimally processed foods", which is the supply and possibility of acquisition of foods as they are found fresh or with minimal alterations aimed at product conservation; and "social movements", which is the collective sociopolitical and cultural actions that allow different ways for society to organize and to express its demands.

The microsystem is the environment in which the same cooking stove is shared; it includes elements pertaining to structure and purchasing power with critical analysis, but it also includes the values and relations between people of the same household. Thus, in order for healthy cooking practice to materialize at home, the purchase of foods needs to be a conscious action, hence the concept of "purchasing power with critical analysis", as well as having a place that allows for the preparation of meals: a "kitchen with basic infrastructure". Regarding the field of values and relations in the private sphere, a positive contribution to the development of cooking autonomy is that people living together assign "importance to cooking" in addition to exercising "sharing of cooking activities", ranging from purchase of groceries to cleaning the kitchen.

The agent level, defined here as individuals' ability to change their food environment by preparing meals, includes the components pertaining to individual skills. Since information is necessary for decision-making and thus for autonomy, the model entails components pertaining to individual knowledge: "knowledge on adequate and healthy food", which consists of understanding that eating should be balanced, prioritizing fresh or minimally processed foods, and that culinary preparations should be made with these foods, limiting the consumption of ultra-processed foods; and the knowledge obtained by cooking practice ("experience and contact with cooking"). Meanwhile, the components "interest, confidence, and disposition for cooking" and "cooking skills" express the individual's powers in developing autonomy in the kitchen.

Besides these components, considering the great work involved in the daily practice of home cooking, this level also covers the "strategic attitude" component, consisting of a dynamic stance towards the daily challenges in cooking, such as organizing specific days for cooking larger amounts to freeze. Box 1 provides more examples of this and other components of the agent level.

Thus, based on this model, we defined cooking autonomy as the capability to think, to decide, and to act to prepare meals from scratch, influenced by interpersonal relations, environment, cultural values, access to opportunities, and guarantee of rights. This definition is also intended to emphasize the relational nature of cooking autonomy. In other words, it is not an attribute developed exclusively by

**Box 1**

Examples of actions the agent can perform to develop cooking autonomy.

LEVEL	COMPONENT	EXAMPLES OF PRACTICES THE AGENT CAN PERFORM TO CONTRIBUTE TO THE DEVELOPMENT OF COOKING AUTONOMY
<b>Agent</b>	Knowledge of adequate and healthy eating habits	<ul style="list-style-type: none"> <li>- Plan composite meals using fresh or minimally processed foods, from different food groups, and make healthy combinations with them</li> <li>- Substitute foods from the same group</li> <li>- Avoid certain foods in case of special diets, and prepare alternatives</li> <li>- Store foods adequately and for the right time</li> <li>- Prepare foods according to good handling practices, to avoid contamination</li> </ul>
	Interest in cooking	<ul style="list-style-type: none"> <li>- Seek new cooking recipes</li> <li>- Participate in courses and watch cooking videos</li> <li>- Talk to family members and friends about recipes and techniques for fixing meals</li> <li>- Exchange cooking experiences with others</li> </ul>
	Self-confidence for cooking	<ul style="list-style-type: none"> <li>- Believe in one's own capability to prepare meals</li> <li>- Try new recipes</li> <li>- Reproduce recipes that have been tried before</li> <li>- Retry recipes that did not work well on previous attempts</li> </ul>
	Disposition for cooking	<ul style="list-style-type: none"> <li>- Having the will and energy to prepare meals routinely</li> </ul>
	Cooking skills	<ul style="list-style-type: none"> <li>- Plan and purchase the necessary foods to prepare meals</li> <li>- Prepare meals with whatever is available in the refrigerator and pantry, creating new recipes or adapting familiar ones</li> <li>- Wash, peel, sort, sift, clean, grind, mix, mash, filet, debone, season, fry, steam-cook, boil, scald, bake, broil, grill, sauté, etc. foods</li> <li>- Feel, by the aroma or appearance, for example, by the color, that the food has reached the proper cooking point</li> <li>- Judge the foods' freshness by the texture, based on touch and appearance</li> </ul>
	Strategic attitude	<ul style="list-style-type: none"> <li>- Organize specific days for cooking larger amounts to freeze</li> <li>- Choose paths between work and home that have food markets, grocery stores, and other food outlets to optimize daily activities</li> <li>- Organize weekly chores to allocate time for purchasing foods in places that offer produce at more affordable prices and with better quality</li> <li>- Keep preprepared foods in the refrigerator or freezer, such as sanitized greens and cooked beans</li> <li>- Purchase foods during their harvest season, when they are usually marketed with fewer non-edible parts</li> <li>- Organize foods and utensils in the kitchen so they are readily available</li> <li>- Prepare one-pot recipes to optimize cleaning after preparation</li> <li>- Purchase at food outlets with home delivery orders via e-mail or telephone</li> </ul>
	Experience and contact with cooking	<ul style="list-style-type: none"> <li>- Cook several dishes on different occasions</li> <li>- Cook routinely</li> <li>- Cook with other people</li> </ul>

the individual's intention or characteristics, but also by the fundamental role of relations and dynamics with their surroundings, State action, and values of the time in which one lives.

As for content validation, the experts considered most of the components highly relevant. Only "planting and production of foods", present in the microsystem in preliminary versions, was discarded, since the CVR value (0.60) fell below the study's cutoff (0.62) (Table 1).

**Table 1**

Content validation of the components of the conceptual model of cooking autonomy produced in this study.

Level and their component	CVR *	Number of suggestions for rewording	Version after suggestion for rewording
<b>Chronosystem</b>			
Valorization of cooking and eating in the food culture	1.0	1	No change
Food system committed to prosperity, equity, sustainability, and health	1.0	2	No change
<b>Macrosystem</b>			
Guarantee of the human right to adequate and healthy food, health, and education	1.0	3	Guarantee of the human right to adequate and healthy food, health, education, and food sovereignty
Defense of food sovereignty	1.0	1	
<b>Exosystem</b>			
Public policies devoted to			
Social well-being	1.0	1	No change
Promotion of gender equity	1.0	0	No change
Promotion of racial equality	1.0	0	No change
Food and nutrition security (highlights: availability of clear and easy-to-read food labels; ban on misleading and abusive advertising; price increases on ultra-processed foods; food and nutritional education)	1.0	2	Food and nutrition security
Encouragement for cooking and family and urban farming	1.0	2	Encouragement for cooking Encouragement for agroecological family and urban farming
Healthy and sustainable use of time	0.8	0	Healthy use of time
<b>Mesosystem</b>			
Easy access to unprocessed or minimally processed foods	1.0	2	Availability and access to unprocessed or minimally processed foods
Social mobilization	1.0	2	Social movements
<b>Microsystem</b>			
Kitchen with minimum infrastructure	1.0	2	Kitchen with basic infrastructure
Importance assigned to cooking	1.0	0	No change
Equal sharing of cooking activities between genders	1.0	4	Sharing cooking activities
Purchasing power with critical analysis	1.0	1	No change
Growing and producing foods	0.6 **	4	Discarded
<b>Agent</b>			
Knowledge on adequate and healthy eating	1.0	1	No change
Interest, self-confidence, and disposition for cooking	1.0	1	No change
Cooking skills	1.0	0	No change
Strategic attitude	1.0	0	No change
Experience in cooking	1.0	1	Experience and contact with cooking

CVR: content validity ratio.

\* CVR = (number of experts that classified each item as "essential" [4 or 3, in which 4 = "highly relevant", 3 = "quite relevant" or "extremely relevant, but needs rewording", 2 = "somewhat relevant", and 1 = "not relevant"] - total number of respondents/2)/total number of respondents/2;

\*\* Since this study included 10 experts in this stage, a cutoff of 0.62 was adopted for discarding items (Lawshe <sup>30</sup>).

The largest share of suggestions for rewording referred to the component “equal gender division of cooking activities”, the final version of which is shown in Figure 1. Some experts voiced the need to expand the people involved in the division of cooking tasks to include the entire family, since it is not exclusively between men and women, but everyone within the household. The children’s involvement in cooking meals was thus raised as a relevant point.

There were some suggestions in response to the question, “In your opinion, are there other components besides those already identified that should be included?”, but they were not adopted since their content had already been included in other components, such as the suggestion “the right to information” and “the right to land and housing”, already covered in “food and nutritional security” and in “social well-being”, respectively. Notably, it would be didactic if these elements appeared explicitly in the model; however, with a view towards the model parsimony, an effort was made to produce a more concise text with greater conceptual density of the terms.

### **Connecting home cooking and policy**

The concept of cooking autonomy is a step forward in the scientific literature on home cooking, since it not only links constructs that have been adopted in other models on cooking skills<sup>11,12,51</sup> and human agency<sup>10</sup> but also integrates the public policy dimension with them.

Expanding the understanding of the event empowers a new view from an ecological perspective, focusing especially on public policies that can influence home cooking practice, an aspect not previously studied in the literature. Box 2 presents some examples of actions that can be developed in the public policy sphere, contributing to the development of cooking autonomy. These examples aim to underline how public policies intervene and have a direct interface with issues experienced by the individual in home cooking practice, making clear that individuals do not have the sole responsibility for their eating habits.

Recent publications also view the State as a fundamental and determinant figure in food choices<sup>33,34</sup>. According to Otero<sup>52</sup> (p. 70), the important solution to malnutrition “*should come from the State, with strong regulation, through a profound and systemic change*”. The author is emphatic in disagreeing that the solution might come from consumption, since for him most people lack the economic wherewithal to decide<sup>52</sup>. Other studies have made similar observations<sup>53,54,55</sup>.

According to Swinburn et al.<sup>34</sup>, a central element in the syndemic of obesity, undernutrition, and climate change is “policy inertia”, which consists of the combination of political weakness (or lack of political will) with strong opposition from economic sectors and insufficient pressure by civil society. As a response, they point to actions the State can take to improve eating habits as well as the environment, such as completely implementing the human rights obligations to protect socially underprivileged populations (the right to health and education, for example), reducing the influence of large vested commercial interests in policy development processes to allow governments to implement relevant policies for public health, equity, and planetary sustainability, and eliminating subsidies for products that contribute to the global syndemic, redirecting funds to actions that mitigate it. These proposals converge with the issues covered in our CMCA.

Otero et al.<sup>52</sup> note that currently, the forms of dehumanization caused by extreme poverty permeate various spaces and are expressed in the consequences of an economic system in which the market determines the development model. Approaches to cooking that fail to address consumerism when interpreting the reality thus seem to be insufficient. Therefore, without protective action by the State, people (especially the more vulnerable ones) can easily be subjugated by the impositions of the food industry, for example.

**Box 2**

Examples of policy actions targeting cooking autonomy in population.

LEVEL	COMPONENT	EXAMPLES OF PUBLIC POLICIES THAT OCCUR OR AFFECT DIFFERENT LEVELS AND CAN CONTRIBUTE TO COOKING AUTONOMY
<b>Chronosystem</b>	Valorization of cooking and eating in food culture	<ul style="list-style-type: none"> <li>- Develop and finance comprehensive campaign to promote healthy cooking and eating, based on an equitable division of domestic labor, implemented on different online platforms and media channels</li> <li>- Develop dietary guidelines based on foods and meals (instead of nutrients) that value home cooking</li> </ul>
	Food system committed to prosperity, equity, sustainability, and health	<ul style="list-style-type: none"> <li>- Tax incentives for family farming</li> <li>- Encourage local and traditional food practices</li> <li>- Ban participation by food industry representatives from policymaking on food and nutrition, given the potential for conflict of public and private interests</li> <li>- Establish governance structures to improve the coherence of policies in agriculture, food, health, innovation/research, and development policies</li> </ul>
<b>Macrosystem</b>	Guarantee of human right to adequate and healthy food	<ul style="list-style-type: none"> <li>- Guarantee access to food for all, upholding the human right to adequate and healthy food</li> <li>- Eliminate hunger and reduce food insecurity</li> </ul>
	Guarantee of health	<ul style="list-style-type: none"> <li>- Improve the functioning of the public health system, enforcing its principles and guidelines</li> <li>- Guarantee efficient public security and transportation</li> <li>- Generate opportunities for work and income, social inclusion, reduction of poverty, the efforts against discrimination, and decrease in the populations' vulnerability</li> <li>- Reinforce fundings for health research to generate consistent indicators to support adequate interventions</li> </ul>
	Guarantee of education	<ul style="list-style-type: none"> <li>- Guarantee good quality public education for all</li> </ul>
	Defense of food sovereignty	<ul style="list-style-type: none"> <li>- Encourage local agriculture and family farming</li> <li>- Foment local food markets</li> <li>- Invest in the cultivation of creole seeds and encourage their continuity in traditional communities</li> </ul>
<b>Exosystem</b> Public policies devoted to:	Social well-being	<ul style="list-style-type: none"> <li>- Guarantee minimum subsistence for citizens within parameters of human dignity. This can be done through cash transfer programs; increases in the minimum wage; construction of daycare centers; shelters for the elderly and homeless children, all fundamental aspects for upholding people's rights and for a sustainable and inclusive development</li> </ul>
	Food and nutrition security	<ul style="list-style-type: none"> <li>- Tax unhealthy foods (e.g., sugary beverages, fast food, ultra-processed meats, cookies, etc.) and invest this tax revenue in public health</li> <li>- Provide clear and easy-to-read information on food packaging</li> <li>- Ban misleading and abusive advertising</li> <li>- Promote food and nutrition education via the public health and educational system</li> <li>- Promote and expand access to subsidized unprocessed or minimally processed foods</li> </ul>
	Promotion of gender equity	<ul style="list-style-type: none"> <li>- Promote equal opportunities for individuals of diverse genders</li> <li>- Contribute to the deconstruction of stereotypes and prejudices that interfere directly in the way people carry out work in the public and private spheres</li> </ul>
	Promotion of racial equality	<ul style="list-style-type: none"> <li>- Formulation, implementation, and maintenance of affirmative actions with the objective of reversing negative representation of blacks; promote equal opportunities; and fight prejudice and racism</li> </ul>

(continues)

**Box 2 (continued)**

LEVEL	COMPONENT	EXAMPLES OF PUBLIC POLICIES THAT OCCUR OR AFFECT DIFFERENT LEVELS AND CAN CONTRIBUTE TO COOKING AUTONOMY
<b>Exosystem</b> Public policies devoted to:	Encouragement for cooking	- Include questions about cooking in national surveys on health in order to understand the panorama on the subject and act more efficiently in initiatives for its promotion and support - Commit to continuous support for research and initiatives to promote and support cooking, as a way of preventing diet-related noncommunicable diseases - Fund the construction of collective kitchens in settlements and regions with greater social vulnerability
	Encouragement for agroecological family and urban farming	- Promote initiatives that guarantee sustainable farm production and provide broad and coordinated support for interventions aimed at creating and maintaining spaces for collective farming
	Healthy use of time	- Guarantee labor rights such as paid lunch break and not extending beyond the maximum workday - Improve public transportation, especially in large cities and in the itineraries with the heaviest commuting of workers - Account for the time spent in domestic work, which is currently invisible, in order to compensate for it in the productive workweek
<b>Mesosystem</b>	Availability and access to unprocessed or minimally processed foods	- Improve the availability of healthy foods and limit the availability of unhealthy foods in institutional settings such as schools, universities, and workplaces
	Social movements	- Support and lend visibility to movements that publicize the benefits of cooking and the harms of consuming ultra-processed foods
<b>Microsystem</b>	Kitchen with basic infrastructure	- Reduce the Industrialized Products Tax (IPI in Portuguese) levied on home appliances such as stoves and refrigerators
	Importance assigned to cooking	- Improve the population's nutrition through strategies in education and stimulus for the consumption of unprocessed or minimally processed foods
	Sharing cooking activities	- Invest in and foment projects aimed at promoting more equitable involvement in household chores by women and men, in different communications media (i.e., online and in-person), through different educational strategies (i.e., workshops and chats) and targeted to various audiences (i.e., schoolchildren and health unit users)
	Purchasing power with critical analysis	- Generate opportunities for work and income, social inclusion, reduction of poverty, efforts against discrimination, and mitigation of the populations' vulnerability - Promote and finance initiatives in food and nutrition education
<b>Agent</b>	Knowledge of adequate and healthy eating	- Starting in preschool, provide and implement practical cooking activities for the development of cooking skills and home economics content
	Interest, self-confidence, and disposition for cooking	- Develop, implement, and finance initiatives for encouragement and training in cooking skills, home economics, and adequate and healthy eating, conducted in schools, health units, and social services, among others
	Cooking skills	
	Strategic attitude	
	Experience and contact with cooking	

### **Cooking autonomy and the capability approach**

Since the development of the CMCA is influenced by the theory that considers *Development as Freedom*<sup>18</sup>, it includes elements of the basic essential needs for the exercise of fundamental rights and fundamental freedoms, that is, a sufficient material basis for the person's independence and feeling of self-respect. Self-esteem and trust in one's own worth are the most important primary asset. Having a sense of one's own worth increases the confidence in one's capabilities and thus their capacity to execute plans<sup>18,43</sup>.

Sen<sup>18</sup> and Nussbaum<sup>56</sup> present freedom as an individuals' capability to choose the functions that will comprise their way of life, but the choice depends on the availability of options and access to them. Individuals can only choose the cooking function if they have access to a "kitchen with basic infrastructure". Moreover, for an individual be able to prepare healthy meals, it is necessary not only kitchen equipment and utensils but also "knowledge on adequate and healthy food" and "purchasing power with critical analysis". Cooking healthy meals requires not only "cooking skills", "interest", or "disposition," which are individual elements, but also other elements, such as the guarantee of "education", "health", and "social well-being". Thus, based on the capability approach, cooking autonomy is a human capability, that is, a choice of such functions as buying groceries, reflecting on what to purchase, and having the disposition to cook.

Cooking autonomy can thus be seen as the tip of an iceberg, under which there are numerous intrinsic elements. These are the elements that the model intends to identify as basic in this construct in order to extend, beyond the individual sphere, the components that contribute to the development of cooking autonomy. The capability approach is a theoretical framework that entails two core normative claims: first, the claim that the freedom to achieve well-being is of primary moral importance, and second, that freedom to achieve well-being is to be understood in terms of people's capabilities, that is, their real opportunities to do and be what they have reason to value<sup>57</sup>. Thus, mapping the conditions leading to the real possibility of cooking autonomy is an important contribution by the CMCA.

The capability approach has been used traditionally in population studies to identify the poor, but it has also been adopted for other purposes<sup>19</sup>. Although most normative theories in the capability approach relate it to justice, other values have also been developed and analyzed with it. In the last 25 years, the range of fields in which it has been applied and developed has expanded greatly<sup>19</sup>. Other studies have been developed in the public health field, similar to ours; still, the largest share of studies have focused on poverty and the assessment of well-being and quality of life<sup>58</sup>. Although it has still not been incorporated by the field of Nutrition, other studies have used the capability approach as part of the concepts constructed on quality of life<sup>56,57,59</sup> and as to expand the health concept<sup>60</sup>.

As discussed above, the capability approach refers to what individuals are capable of. The CMCA perspective aims to reflect on the degree to which the individuals have the possibility of being protagonists in their eating (being) or in practicing home cooking (doing). The concept extrapolates the simple fact of knowing or not knowing how to eat adequately or to cook, while it encompasses the degree to which the individual has the opportunity to be capable of "being" autonomous in the kitchen. Thus, it refers not only to qualifications and training alone, but to conditions to perform a given event, in this case cooking autonomy.

As illustrated in Box 1, in the component "strategic attitude", the agent can cook a full meal in a single pot or pan, for example, rice with vegetables (which are stored cut and sanitized in the refrigerator) and chicken (already stored clean and in pieces) in order to optimize time in the kitchen. However, this individual attitude, aimed at saving time, in both the preparing and cleaning stages, involve a very different complexity from that of the State's action in the same component. The State can act to implement food and nutrition education, such as practical cooking activities for the development of cooking skills, in the National Common Curricular Base, which is a Brazilian document that determines the essential learnings to be addressed in the country's schools. The State can also act in the development, implementation, and financing of training initiatives for cooking skills, home economics, and adequate and healthy food, providing individuals with "enabling processes", i.e., the structure, and expanding their "capability set"<sup>18</sup>.

Finally, Robeyns<sup>19</sup> emphasizes that for philosophers and politicians interested in further developing the capability approach into a coherent political theory, a clear understanding of capabilities

as freedoms to choose or freedom of opportunities may pave the way for future work. Therefore, by considering this approach for the conception of the CMCA, cooking autonomy is seen as freedom for cooking, developed based on individual skills in a favorable environment, that is, with available resources for the agent's actions.

## Conclusion

In conceptualizing cooking autonomy, a highly complex event, the intention was not to develop something that sounds as being unattainable or to develop a paralyzing approach. Conversely, the purpose was to conceptually reveal, through an ecological approach, which elements at the different levels are associated with protagonism in the preparation of healthy homemade meals, evidencing the roles of the State and of the individual in this process and contributing to overcoming the discourse that blames the individual for rarely or never cooking at home.

We hope that the conceptual model proposed here will contribute to studies and public policies that address home cooking from a broader perspective, which also considers important elements beyond the home and the individual sphere. This conceptual model can also provide the basis for building indicators of cooking autonomy to be used in population-based studies.

Finally, we hope that the study outputs may help expand the dialogue among the fields of Law, public policies, and cooking and support measures to promote healthy eating and food and nutrition security.

## Contributors

M. F. B. Oliveira developed the data analysis and wrote the manuscript. Both authors were responsible for the conception and design of the study, and read and approved the version for publication.

## Additional informations

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## Resumo

O empoderamento na culinária doméstica tem sido tratado recentemente, na literatura específica sobre o tema, como uma questão de domínio de habilidades culinárias e de capacidade em superar obstáculos sociais, físicos e econômicos. Ainda não há, contudo, estudos que relacionem o papel do Estado a essa importante prática promotora de saúde em casa, que é o cozinhar saudável. Desse modo, este trabalho adotou como objetivos elaborar o conceito e desenvolver o modelo conceitual multinível de autonomia culinária (MCAC), a fim de relacionar o papel do Estado à prática da culinária saudável em casa. Trata-se de um estudo teórico-conceitual dividido em três fases: elaboração conceitual, consulta a painel de especialistas e validação de conteúdo do MCAC desenvolvido neste trabalho. Ampla revisão bibliográfica serviu de base teórica e conceitual, com destaque para a abordagem das capacidades humanas de Amartya Sen. No total, 28 especialistas opinaram em oficinas de escuta e em entrevistas. A autonomia culinária foi definida como a capacidade de pensar, decidir e agir para preparar refeições em casa, usando majoritariamente alimentos in natura ou minimamente processados, sob a influência das relações interpessoais, do meio ambiente, dos valores culturais, do acesso a oportunidades e da garantia de direitos. O MCAC possui seis níveis, que diferem entre si quanto ao grau de participação do agente. Além do MCAC, são apresentados dois quadros que fornecem exemplos de práticas do agente e de ações que podem ser desenvolvidas no âmbito de políticas públicas pelo Estado. Pioneiro na literatura mundial, o MCAC apresentado fornece as bases conceituais para o desenvolvimento de pesquisas e intervenções sobre o assunto, não apenas focando nas habilidades individuais, mas também no papel das políticas públicas.

Culinária; Autonomia Pessoal; Aptidão; Modelos Teóricos; Políticas

## Resumen

El empoderamiento de cocinar en el hogar se ha tratado recientemente en la literatura como una cuestión dentro del ámbito de las habilidades para cocinar y la capacidad para superar obstáculos sociales, físicos, y económicos. No obstante, hasta ahora ningún estudio ha relacionado el papel del Estado para esta importante práctica de promoción de la salud en el hogar, denominada cocina sana. Nuestro objetivo ha sido elaborar el concepto y desarrollar un modelo conceptual multinivel de autonomía culinaria (MCAC), con el fin de relacionar el papel del estado para la cocina sana en el hogar. Se trata de un estudio teórico-conceptual consistente en tres fases: elaboración conceptual, consulta de panel de expertos, y validez del contenido del MCAC desarrollado en este ejercicio. La revisión general de la literatura sirvió como base teórica y conceptual, destacando el enfoque basado en las capacidades de Amartya Sen. Un total de 28 expertos proporcionaron sus opiniones escuchando talleres y entrevistas. La autonomía culinaria se definió como la capacidad para pensar, decidir, y actuar para preparar comidas desde cero, influenciada por las relaciones interpersonales, el ambiente, valores culturales, acceso a oportunidades, y garantía de derechos. El MCAC cuenta con seis niveles, diferenciados según el grado de participación individual del agente. También presentamos dos tablas con ejemplos de las prácticas y acciones de los agentes que se pueden desarrollar por parte del Estado en la esfera de políticas públicas. Como modelo pionero en la literatura mundial, el MCAC proporciona la base conceptual para el desarrollo de estudios e intervenciones en la autonomía culinaria, centrándose no solo en las habilidades individuales, sino también en el papel de las políticas públicas para la cocina sana en el hogar.

Culinaria; Autonomia Personal; Aptitud; Modelos Teóricos; Políticas

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