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The Challenging Task of Measuring Home Cooking Behavior.

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Abstract

The link between home cooking and health is being actively explored in both observational and experimental studies. However, research on this topic is limited by the lack of cooking behavior metrics. Most existing assessment tools focus only on cooking frequency or one's ability to complete specific a priori food preparations. Cooking is a complex and multifaceted behavior that is influenced by culture, environment, and social norms. More flexible and adaptable measurement approaches are needed to elucidate the spectrum of cooking ability in the population and, in turn, develop meaningful recommendations and interventions.

Keywords

Cooking; food preparation; behavior assessment

Introduction:

Cooking skills are an important and growing area in nutrition research, and the relationship between cooking and health is a current topic of investigation. Epidemiological evidence suggests cooking frequency is positively associated with diet quality^{1,2}, highlighting the potential impact of cooking education interventions to reduce diet-related disease. In turn, cooking education is increasingly popular, with community cooking programs increasingly offered in health centers, churches, schools, community centers, and even hospitals and medical schools^{3–6}. Promoting healthful food preparation may support practical nutrition education, but cooking at home is not always inherently healthy. Cooking is a complex and multi-faceted behavior, and its relationship to diet quality depends very much on what is being prepared.^{1,7} Most existing assessment tools of adult food preparation, however, focus only on cooking frequency or one's ability to complete specific a priori food preparations, limiting research on this topic.

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A recent publication by Hagmann et al⁸ represents a valuable contribution to this field of research through its examination of self-perceived cooking skills and acquisition of such skills among a large sample of adults in Switzerland. The authors' use of a validated cooking skills metric is a strength. However, the measure itself (i.e. self-perceived ability to complete a priori culinary targets) illustrates some of the inherent challenges of defining and measuring cooking skills, particularly as related to diet quality and health and in a diverse population, such as the United States. The aim of this Perspective is to explore these challenges and describe two novel tools of cooking behavior assessment.

Discussion:

Exclusive measures of cooking frequency or time spent cooking fail to differentiate between higher and lower quality meal preparations^{2,9,10}. It is the authors' opinion that more detailed measures of cooking skills, behavior, and related psychosocial constructs are essential to move both observational and experimental research forward. However, developing broadly applicable home cooking measures is challenging. First, the concept of "healthy" versus "unhealthy" cooking is difficult to define and operationalize, as healthy cooking for one person may look very different than healthy cooking for another¹¹⁻¹³. Similarly, the very act of "cooking" varies in definition across the population, with some conceptualizing an act as "cooking" only when scratch or raw ingredients are used or when heat is applied¹⁴. Second, home food environments are influenced by structural (e.g. overnight work schedules, access to grocery stores) and economic factors as well as social and cultural norms (e.g. religious avoidance of certain foods, norms around food preferences and cultural culinary traditions)¹⁵⁻¹⁷, so measures must be flexible enough to remain relevant across different circumstances. Third, the validation of home cooking metrics is limited by the complexity of cooking behavior and lack of gold standard or objective measures.

Existing metrics of cooking mainly examine self-efficacy/confidence or behavioral capacity to complete tasks.¹⁸⁻²² For example, Larson et al and Laska et al measured self-reported frequency of helping prepare dinner, buying fresh vegetables, writing a grocery list, preparing a green salad, preparing a dinner with chicken, fish, or vegetables, and preparing an entire dinner for two or more people.^{18,19} Utter et al examined cooking skills by assessing a combination of cooking frequency, frequency of preparing a meal with vegetables, and self-perceived cooking skill adequacy.²⁰ Lavelle et al proposed a measure of cooking skill confidence that asked participants how good they were (on a scale of 1 to 7) at a number of specific tasks.²¹ The measure used by Hagmann et al²² evaluates self-reported cooking skill sufficiency and self-perceived ability to complete a series of culinary preparations including: a hot meal without a recipe, gratin, soup, sauce, cake and bread. While this measure may be appropriate for use in Switzerland, these items are unlikely to resonate across more diverse populations such as the United States. While the paper shows a weak correlation between their measure of cooking skills and diet quality, an alternative measure less tied to one's ability to perform certain tasks may show a stronger relationship. Further, it is the authors' opinion that several of the cooking 'skills' (e.g. cake, bread, gratin, many hot meals) are not particularly healthy. Additionally, a person may be a highly proficient cook but not ever cook gratins, cake or bread. The Hagmann et al. measure has been used in other populations; Tani et al adapted the measure for common Japanese food

preparations including boiling eggs and vegetables, grilling fish, stir-frying meat and vegetables, and making miso soup.²³ Measures that do not attempt to quantify ability to do specific tasks / cook certain items, but rather take a more adaptable approach to understanding cooking may be more effective in elucidating the spectrum of cooking quality in the population.

The Cooking and Food Provisioning Action Scale (CAFPAS) is a measure of food agency and is more sensitive to the intricacies of the cooking process including upstream (e.g. time constraints, food access/environment) and downstream factors (e.g. personal attitudes and self-efficacy).^{24,25} The 28 item scale includes three subscales (self-efficacy, attitude, structure). In an initial validation study, the CAFPAS had high internal consistency (Chronbach's alpha>0.70 for all 3 subscales and for the scale overall). Criterion validity was assessed in relation to the Food Involvement Scale ($r=0.65$), indicating strong criterion-related validity.²⁴ The CAFPAS has been effective in predicting differences in both cooking behaviors and diet quality in subsequent studies in different populations (adults, college students).^{25,26}

The CAFPAS measures one's agency, or self-efficacy, around food procurement and preparation without a priori identifying the specific cooking actions or skills. The CAFPAS measures attitudes, self-efficacy and ability to navigate structural barriers to food procurement and preparation. This approach recognizes that cooking skills and behavior are contextually dependent, and avoids the need for the researcher to define a priori the kinds of foods a person *should* be able to cook or *how* they should prepare them to be considered skilled. Higher food agency (as measured by CAFPAS) is associated with higher cooking frequency, higher scratch cooking, and better diet quality.^{25,26}

The Healthy Cooking Index (HCI) is another alternative metric based on a systematic review of observational and experimental research²⁷. The HCI considers 19 broad, culturally-flexible cooking practices with the potential to influence the biochemical composition of prepared foods and downstream markers of nutritional health. The HCI codes +1/-1 for positive/negative behaviors demonstrated during a single food preparation event and generates an overall cooking quality score ranging from -9 to +10. The HCI has been successfully applied to observational data of home cooking events; higher HCI scores are associated with lower saturated fat and higher fiber, fruit and whole grain content of prepared meals. However, participants were unable to correctly self-report their own HCI behaviors when compared to direct observation²⁸. The HCI is currently undergoing refinement for use as a self-report tool. The HCI is the only measure that has been compared to a ground truth assessment (direct observation of home cooking), which suggests other cooking metrics may be subject to response bias if items are not carefully operationalized.

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Implications for Research and Practice:

These two tools represent early forays into meaningful home cooking measurement in the United States. It is the authors' opinion that, as a growing sub-field of nutrition, researchers must move beyond measurement of cooking skills as the ability to cook certain foods. The "cooking equals healthy" assumption, as well as the structural and contextual factors that shape cooking behavior and the mechanisms linking cooking, related practices, and health outcomes warrant further interrogation. The authors suggest that measures of cooking practices be carefully constructed, sensibly validated, and thoughtfully applied to diverse populations in tandem with objective measures of nutrition and health.

Available evidence suggests that cooking meals at home is, indeed, an important health behavior. However, more work is needed to improve our understanding of food preparation practices and behavior patterns and how they are related to diet and downstream health outcomes. Valid and reliable measurement tools that recognize the contextually dependent, complex nature of cooking behavior and cooking skills are critical to this area of research.