

Examining Eating: Bridging the Gap Between ‘Lab Eating’ and ‘Free-Living Eating’

Paper to appear in the Journal of the Association for Consumer Research, Vol. 7, no. 4

Kelly L. Haws (corresponding author)
Anne Marie and Thomas B. Walker, Jr. Professor of Marketing
Owen Graduate School of Management, Vanderbilt University
kelly.haws@vanderbilt.edu

Peggy J. Liu
Ben L. Fryrear Chair in Marketing and Associate Professor of Business Administration
Katz Graduate School of Business, University of Pittsburgh
peggy.liu@pitt.edu

Brent McFerran
W.J. VanDusen Professor of Marketing,
Beedie School of Business, Simon Fraser University and
Professorial Research Fellow
Deakin Business School, Deakin University
brent.mcferran@sfu.ca

Pierre Chandon
The L'Oréal Chaired Professor of Marketing - Innovation and Creativity
INSEAD
pierre.chandon@insead.edu

**Examining Eating:
Bridging the Gap Between “Lab Eating” and “Free-Living Eating”**

ABSTRACT

Food consumption and its physiological, psychological, and social antecedents and outcomes have received considerable attention in research across many disciplines, including consumer research. Although researchers use various methods to examine food decision-making, many insights generated stem from observing eating choices in tightly controlled lab settings. Although much insight can be gained through such studies (or “lab eating”), it is apparent that many factors differ between such settings and everyday consumption (or “free-living eating”). This article highlights key differences between “lab eating” and “free-living eating,” discusses ways in which such differences matter, and provides recommendations for researchers regarding how and when to narrow the gap between them, including by enriching lab studies in ways inspired by free-living eating. Besides suggesting how researchers can conduct studies offering a deeper understanding of eating patterns, we also highlight practical implications for improving food consumption for consumers, marketers, and policymakers.

Keywords: food, research methods, obesity, eating patterns, external validity

Abstract word count: 145/150 words

Food is one of the most widely studied consumer research topics. Indeed, although obesity's causes are multi-faceted and complex, food choices play a key role in weight gain (Livingston and Zylke 2012). Moreover, issues such as sustainability (Block et al. 2016) and general well-being (Block et al. 2011) are also important food-related outcomes. Therefore, understanding people's food selections and consumption and their responses to various interventions shaping these choices is important, and consumer research has made considerable progress in this regard (Cadario and Chandon 2020). At the same time, researchers often use laboratory studies to make recommendations for real-world interventions, despite not having evidence that they are effective beyond lab settings.

Like many areas of consumer research, researchers have differing aims when conducting food research, which should guide their methodological choices and trade-offs between external and internal validity (Calder, Phillips, and Tybout 1983; Lynch 1982, 1983, 1999). Theory testing, for example, warrants controlled "lab eating" studies. Conversely, applying a theoretical prediction to a specific context, say to estimate the effects of a local soda tax on children's convenience store purchases (Seiler, Tuchman, and Yao 2021), warrants a study closely mirroring the context and population of interest and capturing people's eating behaviors unconstrained by researchers—which is known as "free-living eating" in nutrition research (e.g., Petty, Melanson, and Greene 2013).

We propose that although "lab eating" as it is often conducted is suitable for some research goals, there is considerable opportunity to better bridge the gap between "lab eating" and "free-living eating" by enriching lab eating studies to account for background factors that exist within free-living eating and/or by using more multi-method approaches. Indeed, researchers often fail to capture, or even acknowledge, the many background factors that exist

within “free-living eating” environments when reporting their “lab eating” research studies. This compromises attempts to translate lab findings into other contexts, including the real world (Lynch 1982). We contend that researchers should consider these factors in developing “enriched” lab studies, enhanced in ecological validity and realism (Morales, Amir, and Lee 2017; Van Heerde et al. 2021), and we provide recommendations for doing so. Moreover, we argue that researchers should consider incorporating these factors as moderators in their theories and studies, thereby illuminating boundary conditions or enhancing external validity by showing robustness to variations in these background factors (Lynch 1983). Although we focus on recommendations drawing from “free-living eating” to improve “lab eating,” field studies themselves are also specific to particular settings. Conducting studies in the field increases ecological validity (i.e., mapping onto a situation that occurs in real life) but does not automatically increase external validity (i.e., the ability of the results to hold across different settings or background factors than those studied, characterized as “conceptual replicability or robustness” by Lynch [1982]). As such, some of our recommendations for considering background factors that exist within “free-living eating” also extend to field studies.

We next offer three illustrations of the potential disconnect between “lab eating” and “free-living eating.” First, estimates of the magnitude of the effect of four front-of-pack nutrition labels on the nutritional quality of the basket of foods purchased were 17 times smaller in a large randomized controlled trial conducted in supermarkets (Dubois et al. 2021) than in a high-quality incentive-compatible lab study using the same dependent variable (Crosetto et al. 2020). Second, meta-analyses of lab studies support the effectiveness of using smaller plates as a means of reducing consumption when people serve themselves (Holden, Zlatevska, and Dubelaar 2016; Hollands et al. 2015). However, a recent study using procedures more closely mapping onto

“free-living eating” found no effect of smaller plates on how much people serve themselves and how much they eat (Kosıte et al. 2019). Third, effect sizes can also be larger in “free-living eating” than in “lab eating”: Gough et al. (2021) found that giving people larger portions of popcorn increased consumption more when the study was conducted in people’s homes than when it was conducted in a lab. These examples highlight different consequences of not fully considering gaps between “lab eating” and “free-living eating.”

This article has two main goals: 1) to introduce and explicate key differences varying along a continuum from “lab eating” to “free-living eating” using a classic who, what, where, when, why, and how framework; and 2) to suggest ways to adapt research approaches to bridge the gap between “lab eating” and “free-living eating” in ways appropriate to the research’s objectives. We also echo recent calls for multi-method approaches (Inman et al. 2018), particularly when researchers have both theoretical and practical objectives. Accordingly, we offer a sampling of different researcher objectives in the eating domain and how various methods may best match those objectives.

--Insert Table 1 about here--

“LAB EATING” VERSUS “FREE-LIVING EATING”

We begin by introducing and explicating key differences between “lab eating” and “free-living eating” using a classic who, what, where, when, why, and how framework (see Table 1 for a summary of key differences and recommendations about how to bridge the gap). Although we discuss them as two distinct categories, “lab eating” and “free-living eating” are at two ends of a continuum ranging from very tightly controlled and somewhat sparse laboratory studies to everyday eating choices with no interference from researchers, and therefore a range of other research methods (several mentioned later, see Table 2) fall between these extremes. We also

note that although not all who, what, where, when, why and how factors will be relevant to every research question or aim, they are worth consideration as potential background factors to assess and report.

Who?

The first critical aspect of “who” is whose eating we measure. Much “lab eating” is conducted using undergraduate students. The notion that undergraduate samples are WEIRD (western, educated, industrialized, rich, democratic) is well-documented (Henrich, Heine, and Norenzayan 2010), and so are the age (Rolland-Cachera et al. 1991) and socioeconomic (Claassen et al. 2019) gradients of obesity. Yet, demographic characteristics are not extensively considered or even reported in consumer research publications as they often are in nutrition, medical or public health research, contributing to the potential for overlooking important differences in effects based on underlying demographic factors (Lynch 1982). For example, consumer research articles commonly report the average age and gender of their samples but nutrition, medical, and public health publications also report information on race, ethnicity, income, and education. These publications (e.g., *Appetite*), go further and instruct authors to report the results separately for each of these groups. We contend it is important to focus more on sample details to assess generalizability over time and place. For example, although many consumer researchers motivate their eating studies by the need to understand the obesity epidemic, “lab eating” studies typically recruit participants with normal weight. Yet, normal-weight participants sometimes respond differently to marketing tactics than do people with obesity (Cornil et al. 2021).

Another important “who” question is with whom people are eating. Food consumption is frequently social, and others’ choices provide strong inputs into what to eat (Ariely and Levav

2000; Liu, McFerran, and Haws 2020), where to eat (Liu and Min 2020), when to eat (Higgs 2015), and how much to eat (Liu et al. 2020; McFerran et al. 2010). Eating is connected with social and cultural norms, as shared plates (Woolley and Fishbach 2019), family meals (Hammons and Fiese 2011), and the importance of food at celebrations attest. Yet in “lab eating,” participants are often in private cubicles; only rarely are there groups (see for an exception, Lowe and Haws 2014). Even then, others are often strangers—either fellow participants or research confederates. Consumers also have social identity and self-presentation goals germane to food, which should be more salient in public eating settings. For instance, choosing to eat meat (Gal and Wilkie 2010; Rozin et al. 2012) and unhealthy food (Vartanian, Herman, and Polivy 2007) are both viewed as more masculine. Further, in “free-living eating,” norms such as eating to please the host, to leave a certain amount for others, or to finish one’s food to avoid waste are likely stronger than in “lab eating.” Finally, meals in large groups tend to last longer and thus increase consumption (De Castro and Brewer 1992).

What?

Although multiple literatures (e.g., anthropology, culture, biology) address what people eat and how they develop taste preferences over time, much “lab eating” focuses on one-time choices. Typically, the choice set consists of two snack options (e.g., fruit salad vs. chocolate cake, almonds vs. M&Ms). In contrast, “free-living eating” commonly involves eating multiple foods simultaneously, especially in non-snack meal consumption, which accounts for three-fourths of total caloric consumption by one estimate (Yoquinto 2011).

Further, for convenience or liability issues, some foods and beverages are almost never studied in “lab eating.” For example, few studies involve hot food (for an exception, see Yamim,

Mai, and Werle 2020). Further, although 70% of Americans drink alcohol at least once a year (NIAA 2021), and although food and alcohol choices influence one another (e.g., food-wine pairings; Harrington 2007), alcohol consumption is almost never studied in consumer research (for an exception see Cornil, Chandon, and Krishna 2017). Relatedly, although beverages in general influence food choices (Kruger and Kruger 2015), increase fullness (Lappalainen et al. 1993), and are typically available when “free-living eating,” beverages other than plain water are often not available in “lab eating.” Additionally, in “free-living eating,” choice set options are often constructed by consumers either in advance through planning (e.g., shopping lists; Block and Morwitz 1999; Suher, Huang, and Lee 2019) or in the moment (e.g., searching the pantry; impulse shopping). In “lab eating,” choice sets are highly engineered and “gated” decisions influencing what one will eat. When “free-living eating” away from home, consumers may select among a large set of restaurants or among many menu items from a specific restaurant.

Even studies that introduce realism by making more than two food options available often constrain consumers to select only one option (e.g., Redden and Haws 2013; for exceptions, see Liu et al. 2015 and Haws and Liu 2016). Or, when consumers are allowed to select multiple options (Bayuk, Janiszewski, and Leboeuf 2010), the food is often not actually consumed. Additionally, “free-living eating” also involves varying choice sets and foods consumed over time. Yet the limited “lab eating” that considers sequential food choices tends to focus on highly compressed time periods—typically two choices from similarly constrained choice sets within the same research participation session of an hour or less (Fishbach and Dhar 2005; Mukhopadhyay and Johar 2009).

Another factor driving eating differently in “lab” versus “free-living” settings is information provision, including of ingredient or nutrition content (Hawley et al. 2013; Liu et al.

2014; Nikolova and Inman 2015). Such information is often purposely inaccessible in “lab eating” In some studies, food is presented already removed from its package and poured into a bowl or plate (Liu et al. 2015; Yang, Gu, and Galak 2017), whereas in others, food is presented in a sealed bag (sometimes in a clear bag that allows participants to see the contents clearly, without any brands or labels; Scott et al. 2008). In most cases, foods (even packaged snacks) are often presented without ingredient or nutrition information unless the research question is about this type of information. When presented, such information is provided “close up” with fewer distractions than in the grocery store or in a restaurant, biasing effect sizes upward (Dubois et al. 2021). Additionally, other constraints besides nutrition (e.g., cost, convenience) also affect what consumers choose when “free-living eating,” and yet these factors are typically held constant in “lab eating” (e.g., food is free and already prepared).

Where?

Lab settings are typically designed to be sparse, with neutral ambient characteristics. For instance, “lab eating” tends to use standard (disposable) plates, cups, and occasionally other eating utensils. In contrast, “free-living eating” generally involves more elaborate table settings with a wider array of non-disposable plates, cups, eating utensils, and serveware. Yet the nature of these elements can have a significant effect. For instance, plate size may influence how much people serve themselves, affecting amounts consumed in some lab settings (Holden et al. 2016), while plate material (disposable vs. reusable) affects how much is consumed or thrown away (Williamson, Block, and Keller 2016). Even utensil size influences how much people eat (Geier, Rozin, and Doros 2006; Hollands et al. 2015). Similarly, décor, lighting, noise, background music, temperature, or crowdedness all affect “free-living eating” (Stroebele and De Castro

2004), mostly through their effects on distraction and consumption monitoring (as reviewed by Wansink and Chandon 2014). For example, people eat more during and after watching television because it reduces attention to their food (Hetherington et al. 2006; Higgs and Woodward 2009). In short, many aspects of one's surroundings can influence food consumption.

When?

In “lab eating,” participants often 1) do not know they will be eating beforehand or what they will eat, and 2) have limited choice regarding what time to participate; this participation time may not correspond to their natural eating times. Yet, timing matters: food choices depend heavily on time of day (Cadario and Morewedge 2022; Gullo et al. 2019) and can differ for weekdays versus weekends or special holidays (Hildebrand, Harding, and Hadi 2019; Khare and Inman 2006). Yet, lab eating research typically does not report the timing of the study and rarely examines food intake during weekends or holidays, and almost never in the early morning or late evening.

In “free-living eating,” consumers often exert some effort to obtain their food (even simply walking to the pantry); food accessibility thus affects when they eat, as more accessible food increases eating (Baskin et al. 2016; Swinburn et al. 2011). Consumers also make advance food decisions to accommodate later eating episodes, which may also account for prior consumption. In contrast, lab participants typically receive food without needing to exert effort and eating decisions are mostly for the present. Overall, in the lab, participants have much less control over “when” to eat than in free-living eating.

Why?

Consumers possess wide-ranging motivations to eat. The Eating Motivation Survey (Renner et al. 2012) captures this breadth of motivations with varied statements such as, “because I’m hungry,” “because I usually eat it,” and “because it is inexpensive.” However, this long list does not include “because I was asked by researchers”. Although consumption in “lab eating” is rarely mandatory (due to ethical guidelines and dietary allergies/restrictions), participants likely feel compelled to eat unless they have dietary allergies/restrictions. Contributing to this implicit compulsion, participants have been asked to eat by an authority figure, assume other participants are also eating during the session (even if they cannot observe them eating), and the food is presented without financial cost to them. Overall, most prior research suggests that all or most participants complied with instructions to start eating or are silent on the issue, suggesting that explicit or implicit “no-choice” options are not the norm. This matters because being compelled to eat leads to different food choices than choosing to eat. For example, Finkelstein and Fishbach (2010) found that imposed healthy eating leads to greater subsequent consumption.

Other common lab eating paradigms include purported “taste tests” (Brendl, Markman, and Messner 2003; Laran and Salerno 2013) or an offer of food “to enjoy while you [do something else],” such as watch a video (Duke and Amir 2019; Liu et al. 2015; Tangari et al. 2019). Another prevalent approach is to present food as study compensation or a bonus (Ferraro, Shiv, and Bettman 2005). Although these paradigms can identify causal effects on food intake (Robinson et al. 2017), they may differ dramatically from motivations for “free-living eating.”

Intuitions about hunger’s importance as a driver of eating lead researchers to design “lab eating” studies that aim to account for hunger yet still differ from “free-living eating” in various ways, by: 1) asking participants to fast beforehand (Chae and Zhu 2014); 2) assessing hunger

levels prior to eating (Tangari et al. 2019); and 3) measuring the time since participants last ate (Duke and Amir 2019). Hunger has an obvious influence on eating behaviors, but also on the effects of many of the interventions studied by researchers, and its effects are not necessarily linear. For example, “lab eating” studies demonstrated that sensory imagery interventions are more likely to lead people to choose smaller portion sizes when they are moderately hungry than when satiated (Cornil and Chandon 2016). However, “free-living eating” research subsequently found that the effectiveness of sensory interventions diminishes when hunger is very high (Lange et al. 2020). This unanticipated ceiling effect was only discovered because the “free-living eating” study was conducted with 10-year-old school children at the time of their afternoon snack, when many were extremely hungry.

Beyond hunger, multiple other factors concurrently motivate eating behaviors, including liking, emotional states, visual appeal, convenience, social norms, and prices (Renner et al. 2012). We do not describe these in detail herein (and our coverage of “why” in Table 1 is intentionally general), but we note that researchers generally attempt to streamline motivations (e.g., manipulate some motivation while controlling for others) or discount motivations to eat (e.g., ignore most known motivations) in “lab eating.” However, these motivations often interact with interventions studied, sometimes even reversing effects. For example, André, Chandon, and Haws (2019) found that people prefer “low-fat” breakfast cereals to those without artificial flavors when they have a dieting goal, but have the opposite preference when their goal is to eat healthily. In short, the full “why” behind daily eating is nearly impossible to recreate in a “lab eating” setting, but measuring, recording, and controlling for some basic motivations may help address these gaps.

How Much?

We focus our “how” specifically on “how much,” given its centrality to overall consumption. Food-specific “fullness,” known as sensory-specific satiety (SSS; Rolls et al. 1981), leads consumers to stop eating a food because it is no longer enjoyable, even though they may not feel physiologically satiated (Cornil 2017). SSS is related to boredom and monotony (Rolls et al. 1981), and when consuming a single food, SSS can lead to ceasing consumption, particularly if a consumer is attending to their decreased enjoyment (Redden and Haws 2013).

However, sometimes decreasing hunger or increasing SSS are not sufficient cues to cease consumption. Some consumers may use cognitive resources to limit amounts immediately available prior to starting consumption—such as by making a deliberate portion size selection (Wertenbroch 1998). In “free-living eating” inside the home, such selections can be made and reversed easily. Deliberate advance portion size selection can be more difficult outside the home, where most restaurants offer entrées in one size, though beverages and snacks (e.g., movie theater popcorn) regularly come with some size options (Haws et al. 2020; Liu and Haws 2020). Within “lab eating,” consumers are often provided with a single portion size option—typically a snack—unless the topic under study is portion sizes.

When the topic is portion sizes selected or amount consumed, lab studies often provide more portion size choices than seen in the marketplace (e.g., in Cornil and Chandon (2016), six different cake slice sizes), both to enable more fine-tuned conclusions about factors influencing portion size choice and to identify nudges that could be employed in the real-world. Further, and closely related to “when” considerations, there are often binding time restrictions (e.g., eating during a 5-minute movie clip; McFerran et al. 2010). Clearly, such restrictions may alter how much is eaten.

Finally, in “free-living eating,” consumers are typically responsible for disposing of (or saving) uneaten food portions, whereas this is rarely true in “lab eating.” The responsibility for managing uneaten food portions can also shape how much people eat and how they spread food portions over time (Krishna and Hagen 2019).

RECOMMENDATIONS FOR FOOD RESEARCH

Food decision making is an area in which internal validity and realism are often difficult to achieve simultaneously. One solution is to consider multi-method approaches (Inman et al. 2018). Indeed, consumer research on food (and other topics) increasingly pairs a single field study with a much longer series of lab studies. This imbalanced approach is not necessarily misguided, but it does imply internal validity is more important than realism. Although we do not think a paper with five field studies and a single lab study is the desired ratio either, we do think more papers adopting a balanced approach would be valuable (e.g., see Rozin et al.'s [2012] study of the genderization of foods as one example).

More pertinent to our current focus, simply adding a field study to a set of lab studies tends to treat external and internal validity as two polar ends of a continuum. Yet field studies are not intrinsically better than lab studies at ensuring that results hold across different contexts or populations (which is the definition of external validity). Rather, improving external validity requires considering whether and how “who,” “what,” “where,” “when,” “why,” and “how much” background factors in Table 1 fit with one’s research, and then controlling, or (better) manipulating factors likely to moderate the effects studied. We contend that this can be done

with only modest procedural alterations, leading to lab studies that increase both external validity (i.e., generalizability) and ecological validity (i.e., mapping to real-life settings).

Therefore, although we favor multi-method approaches when this approach is consistent with the researchers' objectives, we next focus on ideas for enriching "lab eating" studies as an additional path to narrowing the gap between "lab eating" and "free-living eating." We also note that, although we focused on research on healthy eating, the same considerations apply to a broader set of food decision-making topics, such as food well-being, safety, insecurity, and waste (Block et al. 2011; Block et al. 2016).

Incorporating "Free-Living Eating" Factors in "Lab Eating" Studies

Table 1's final column summarizes how our recommendations below relate to the various questions discussed in the previous section. We next discuss three sets of recommendations: 1) broadening research samples; 2) improving relevance of stimuli; and 3) expanding outcome variables.

Broadening research samples. Studying a broader range of consumers is critical for external validity, particularly when making claims about generalizability of one's theoretical effects across background factors (Lynch 1982). Limited reporting of sample characteristics may limit insights or even lead to incorrect recommendations. Further, established findings about western (especially U.S. American) food decisions that we often think of as universal (e.g., the unhealthy = tasty intuition; Raghunathan, Naylor, and Hoyer 2006) do not always hold in other countries. For example, French people, unlike Americans, expect healthy food to be tasty (Werle, Trendel, and Ardito 2013). A reliance on university student samples for lab eating studies also means a narrow age band of participants who are substantially thinner, healthier (in terms of

obesity and comorbidities), and less food insecure than the wider population. Many also dine frequently in all-you-can-eat dining halls.

A focus on student samples means we also rarely study eating in other samples, such as children, in whom food preferences are more formative, or older consumers, who often have different eating goals and health concerns than young adults. For example, research is needed to find interventions that encourage older people to eat and drink more to compensate for the nutritional deficiency and appetite loss caused by aging (Hetherington 1998).

Further, researchers should ask whether they are recruiting household food “decision-makers” or people whose food decisions are often made for them (Liu, Dallas, and Fitzsimons 2019a). For instance, is a lab study on purchasing food conducted with food decision-makers who do most of the grocery shopping? Providing supplemental information about one’s sample (e.g., household food decision roles) would be a simple enhancement. Vosgerau, Scopelliti, and Huh (2020) also emphasized this point by coding food decision papers based on whether participants were recruited due to their food, health, or dietary goals, or whether food related goals were measured or manipulated.

Related motivations with an impact on health outcomes, such as those involving physical activity or sedentary behaviors (Okada 2019) or those involving weight loss goals (Haws et al. 2017), are also important to consider and when relevant, to measure and report. We suggest that collecting, reporting, and controlling for, or examining the moderating effects of not only demographic characteristics (e.g., age, gender, race/ethnicity, BMI, socioeconomic status) but also motivational drivers (e.g., hunger, dieting status, physical activity, dietary restraint, food allergies/preferences) can improve our treatment both of the “who” and the “why” aspects of

eating behavior. Even if individual-level measures are not the focus, they should be collected when feasible and shared to facilitate subsequent meta-analyses.

Improving relevance of stimuli. Just as researchers should consider which aspects of a “free-living” environment’s “what,” “where,” “when,” “why,” and “how much” are relevant to their study aims, they should also consider their stimuli’s relevance to participants. Instead of a set of two food options, researchers could have participants make multiple food choices or provide snacks curated to match the preferences of individual participants (e.g., having participants first rank-order their liking of various foods and then design choice sets accordingly, see Haws, Davis, and Dholakia (2016) and Steffel and Williams (2018)). Certainly, either larger or curated choice offerings will both pose additional costs, which ought to be assessed relative to potential benefits. Perhaps less expensively, increased stimulus pretesting with participants from the same population as the actual study could identify more relevant stimuli for a particular context and participant population (see also stimulus sampling; Wells and Windschitl 1999). Further, simply including a liking measure for a particular food can clarify responses to different interventions (Larson, Redden, and Elder 2014), and reporting liking may help future researchers to design replications mapping more closely onto the original study’s conditions or to reconcile differences in the case of failed replications. In “free living eating,” consumers are rarely forced to eat foods that they do not enjoy, making such foods much less relevant for generality.

Expanding outcome variables. It is important to expand outcome variables beyond the primary focus on “what” consumers eat. For instance, “how much” is especially important to overall health. Research could thus examine both “what” and “how much” within the same study—by having participants choose one snack or multiple snacks and measuring amounts consumed. For example, Cornil and Chandon (2013) provided football fans with four foods

(tomatoes, grapes, chocolate candies, chips) and measured consumption of each food (in grams, total calories, and macronutrients). Other studies involving multiple foods include Winterich and Haws (2011) and Hock and Bagchi (2018). The compatibility of eating multiple foods together could also be measured (and reported, facilitating future reconciliation and replication) or manipulated, to shed light on whether these are multiple foods typically offered and eaten together in real life and if this compatibility matters.

Further, participants could be given the opportunity to choose quantities or even serve themselves (Hagen, Krishna, and McFerran 2017), increasing agency over “how much” even if they did not get to choose “what.” We suggest that combining these methods by, for example, providing a set of relevant stimuli, customizing, and expanding the number of options, and then allowing participants to either choose or self-serve multiple foods will lead to a stronger mapping from “lab eating” to “free-living eating.” The burden on researchers would be relatively light, as lab studies would still be the research method and not all studies in a paper need to employ these enhanced approaches.

Finally, we have focused on actual eating decisions and consumption, but much research focuses on other outcomes including attitudes and intentions with respect to food choices. We encourage researchers to further examine the relationships between these intervening variables and the full set of short and long-term eating-related psychological outcomes.

Research Eating Going Beyond the Lab

Thus far, we have underscored ways to address the gap between “lab eating” and “free-living eating” by enriching lab research. We next highlight four methods going beyond the

traditional lab that have been increasingly used by researchers, often through a multi-method approach, summarized in Table 2.

--Insert Table 2 about here--

Recruiting participants in natural eating environments. In a field-based approach, recruiting and testing participants occurs in their natural eating environments. This approach provides participants with freedom, rather than constraining them to scheduled lab arrival times and pre-selected food choices. Such studies may use an industry partnership to vary aspects of an eating experience in a natural environment. For example, Sevilla, Isaac, and Bagchi (2018) varied the type of claim (numerical vs. percentage rank) and examined actual cheese sales at a farmer's market. Alternatively, researchers may recruit people immediately following freely chosen consumption at a restaurant and collect information about what they ordered (via receipts or self-report), the amount they consumed, and their perceptions of the experience. For instance, Hasford, Kidwell, and Lopez-Kidwell (2018) collected information regarding restaurant diners' orders to estimate calories after their meal. Although field studies naturally bridge many gaps between "lab eating" and "free-living eating," the choice of the natural eating environment should not be based on convenience alone. Field studies are often conducted in schools, workplaces, or hospital cafeterias and less frequently homes or restaurants (but see Schwartz et al. 2012). Consumers likely eat differently based on their location and choose different locations for distinct purposes.

Utilizing purchase data. The second approach we highlight is utilizing food purchase data. One example is Nikolova and Inman (2015), who used food purchase data over a 12-month period and found that a simplified point-of-sale nutritional information system improved the

nutritional value of purchases in eight common categories. Ailawadi, Ma, and Grewal (2018) combined food purchase data from multiple retail chains to look at spending patterns of consumers across outlets, providing unique insights on nearly all grocery purchases for households over an extended period. Finally, Rishika, Feurer, and Haws (2021) used longitudinal loyalty program purchase data from a deli over 14 months to demonstrate differing patterns of strategic licensing and complement these findings using a lab-based approach to provide supportive process evidence.

Utilizing dietary intake information. Third, we highlight unique insights possible from utilizing food diaries or dietary recalls (Stanton and Tucci 1982). Such investigations provide insights geared more towards understanding patterns of food decision-making when “free-living eating” and often offer more agency in eating decisions. For example, Haws et al. (2017), Khare and Inman (2006), and Khare and Inman (2009) utilized longitudinal data collected from such approaches to examine the roles of habits, meal occasions, and dietary variety. Diary data can also be combined with exogenous shocks, such as the victory or defeat of one’s favorite team, in a quasi-experiment (Cornil and Chandon 2013). Additionally, Emich and Pyone (2018) utilized a food diary approach as part of a field study, which compared students whose meals had been paid for (vs. not paid for) and measured their overall consumption through having them record consumption following a cafeteria meal. Finally, Liu et al. (2015) and Liu et al. (2019b) utilized a dietary recall approach to record “free-living eating” choices during the rest of the day following the lab study. These examples illustrate ways to add greater insight into “free-living eating” even though in many of these cases, participants knew that researchers were observing their eating decisions.

Other novel approaches. Finally, there is a role for novel hybrid methods which allow “free-living eating” while providing strong control. One option is enriched “living labs,” furnished to mimic the eating environment (e.g., home or restaurant) while providing video and audio feeds to the researcher. Another option is to conduct a field study controlled remotely, wherein researchers send food and other stimuli (e.g., videos to watch while eating) to people’s homes. For better control, researchers can guide participants and monitor their behaviors via video conference apps or remote monitoring apps. Recently, however, Gough et al. (2021) found a larger portion size effect size for popcorn eaten at home than in a traditional or living lab, suggesting that the living lab may not always provide a better proxy for free-living eating. Again, we emphasize the importance of the underlying objectives of the research in determining which method or combination of methods is the best fit. See table 3 for examples of research objectives and recommended methods for achieving these objectives.

--Insert Table 3 about here—

CONCLUSION

Many important consumer insights have come from studies conducted in carefully controlled lab settings, and we expect most future eating studies to continue to be conducted in this way, especially if researchers’ primary goal is theory testing or testing causal effects in highly controlled circumstances. In some cases, however, studies conducted in the lab have failed to account for the variety of background factors about who, what, where, when, why, and how much people eat in free-living conditions. This has limited the generalizability of lab findings to different contexts and everyday life. Future research, either within single papers or across papers, should strive to enrich lab studies by considering how people normally freely eat

throughout their daily lives. More thorough recording, reporting, and sharing of such background factors (e.g., including them in the data accessible to other researchers) should enable other researchers to look across papers to begin identifying the most potentially impactful background factors (e.g., who, what, where, when, why, and how much) within a given area of food research, thus spurring future research. Researchers should also continue to test interventions in both lab and field settings whenever possible to understand what interventions work differently or have widely disparate effect sizes based on the study setting, further bridging the gap between “lab eating” and “free-living eating.”

REFERENCES

- Ailawadi, Kusum L., Yu Ma, and Dhruv Grewal (2018), "The Club Store Effect: Impact of Shopping in Warehouse Club Stores on Consumers' Packaged Food Purchases," *Journal of Marketing Research*, 55 (2), 193-207.
- André, Quentin, Pierre Chandon, and Kelly Haws (2019), "Healthy Through Presence or Absence, Nature or Science? A Framework for Understanding Front-of-Package Food Claims," *Journal of Public Policy & Marketing*, 38 (2), 172-91.
- Ariely, Dan and Jonathan Levav (2000), "Sequential choice in group settings: Taking the road less traveled and less enjoyed," *Journal of Consumer Research*, 27 (3), 279-90.
- Baskin, Ernest, Margarita Gorlin, Zoë Chance, Nathan Novemsky, Ravi Dhar, Kim Huskey, and Michelle Hatzis (2016), "Proximity of snacks to beverages increases food consumption in the workplace: A field study," *Appetite*, 103, 244-48.
- Bayuk, Julia Belyavsky, Chris Janiszewski, and Robyn A. Leboeuf (2010), "Letting good opportunities pass us by: Examining the role of mind-set during goal pursuit," *Journal of Consumer Research*, 37 (4), 570-83.
- Block, Lauren G., Sonya A. Grier, Terry L. Childers, Brennan Davis, Jane E.J. Ebert, Shiriki Kumanyika, . . . Laura Peracchio (2011), "From nutrients to nurturance: A conceptual introduction to food well-being," *Journal of Public Policy & Marketing*, 30 (1), 5-13.
- Block, Lauren G., Punam A. Keller, Beth Vallen, Sara Williamson, Mia M. Birau, Amir Grinstein, . . . Elizabeth S. Moore (2016), "The squander sequence: understanding food waste at each stage of the consumer decision-making process," *Journal of Public Policy & Marketing*, 35 (2), 292-304.
- Block, Lauren G. and Vicki G. Morwitz (1999), "Shopping lists as an external memory aid for grocery shopping: Influences on list writing and list fulfillment," *Journal of Consumer Psychology*, 8 (4), 343-75.
- Brendl, C. Miguel, Arthur B. Markman, and Claude Messner (2003), "The Devaluation Effect: Activating a Need Devalues Unrelated Objects," *Journal of Consumer Research*, 29 (4), 463-73.
- Cadario, Romain and Pierre Chandon (2020), "Which healthy eating nudges work best? A meta-analysis of field experiments," *Marketing Science*, 39 (3), 465-86.
- Cadario, Romain and Carey K. Morewedge (2022), "Why do people eat the same breakfast every day? Goals and circadian rhythms of variety seeking in meals," *Appetite*, 168, 105716.
- Calder, Bobby J., Lynn W. Phillips, and Alice M. Tybout (1983), "Beyond External Validity," *Journal of Consumer Research*, 10 (1), 112-14.
- Chae, Boyoun and Rui Zhu (2014), "Environmental disorder leads to self-regulatory failure," *Journal of Consumer Research*, 40 (6), 1203-18.
- Claassen, Maria Almudena, Olivier Klein, Boyka Bratanova, Nele Claes, and Olivier Corneille (2019), "A systematic review of psychosocial explanations for the relationship between socioeconomic status and body mass index," *Appetite*, 132, 208-21.

Cornil, Yann (2017), "Mind Over Stomach: A Review of the Cognitive Drivers of Food Satiation," *Journal of the Association for Consumer Research*, 2 (4), 419-29.

Cornil, Yann and Pierre Chandon (2013), "From Fan to Fat? Vicarious Losing Increases Unhealthy Eating but Self-Affirmation is an Effective Remedy," *Psychological Science*, 24 (10), 1936-46.

--- (2016), "Pleasure as a substitute for size: How multisensory imagery can make people happier with smaller food portions," *Journal of Marketing Research*, 53 (5), 847-64.

Cornil, Yann, Pierre Chandon, and Aradhna Krishna (2017), "Does Red Bull give wings to vodka? Placebo effects of marketing labels on perceived intoxication and risky attitudes and behaviors," *Journal of Consumer Psychology*, 27 (4), 456-65.

Cornil, Yann, Hilke Plassmann, Judith Aron-Wisniewsky, Christine Poitou-Bernert, Karine Clément, Michèle Chabert, and Pierre Chandon (2021), "Obesity and Responsiveness to Food Marketing Before and After Bariatric Surgery," *Journal of Consumer Psychology*.

Crosetto, Paolo, Anne Lacroix, Laurent Muller, and Bernard Ruffieux (2020), "Nutritional and economic impact of five alternative front-of-pack nutritional labels: experimental evidence," *European Review of Agricultural Economics*, 47 (2), 785-818.

De Castro, John M. and E. Marie Brewer (1992), "The amount eaten in meals by humans is a power function of the number of people present," *Physiology & Behavior*, 51 (1), 121-25.

Dubois, Pierre, Paulo Albuquerque, Olivier Allais, Céline Bonnet, Patrice Bertail, Pierre Combris, . . . Pierre Chandon (2021), "Effects of front-of-pack labels on the nutritional quality of supermarket food purchases: evidence from a large-scale randomized controlled trial," *Journal of the Academy of Marketing Science*, 49, 119-38.

Duke, Kristen E. and On Amir (2019), "Guilt Dynamics: Consequences of Temporally Separating Decisions and Actions," *Journal of Consumer Research*, 45 (6), 1254-73.

Emich, Kyle J. and Jin Seok Pyone (2018), "Let it go: Positive affect attenuates sunk cost bias by enhancing cognitive flexibility," *Journal of Consumer Psychology*, 28 (4), 578-96.

Ferraro, Rosellina, Baba Shiv, and James R. Bettman (2005), "Let us eat and drink, for tomorrow we shall die: Effects of mortality salience and self-esteem on self-regulation in consumer choice," *Journal of Consumer Research*, 32 (1), 65-75.

Finkelstein, Stacey R. and Ayelet Fishbach (2010), "When Healthy Food Makes You Hungry," *Journal of Consumer Research*, 37 (3), 357-67.

Fishbach, Ayelet and Ravi Dhar (2005), "Goals as Excuses or Guides: The Liberating Effect of Perceived Goal Progress on Choice," *Journal of Consumer Research*, 32 (3), 370-77.

Gal, David and James Wilkie (2010), "Real men don't eat quiche: Regulation of gender-expressive choices by men," *Social Psychological and Personality Science*, 1 (4), 291-301.

Geier, Andrew B., Paul Rozin, and Gheorghe Doros (2006), "Unit Bias," *Psychological Science*, 17 (6), 521-25.

- Gough, Thomas, Ashleigh Haynes, Katie Clarke, Amy Hansell, Mahrukh Kaimkhani, Bethan Price, . . . Eric Robinson (2021), "Out of the lab and into the wild: The influence of portion size on food intake in laboratory vs. real-world settings," *Appetite*, 162, 105160.
- Gullo, Kelley, Jonah Berger, Jordan Etkin, and Bryan Bollinger (2019), "Does time of day affect variety-seeking?," *Journal of Consumer Research*, 46 (1), 20-35.
- Hagen, Linda, Aradhna Krishna, and Brent McFerran (2017), "Rejecting responsibility: Low physical involvement in obtaining food promotes unhealthy eating," *Journal of Marketing Research*, 54 (4), 589-604.
- Hammons, Amber J. and Barbara H. Fiese (2011), "Is frequency of shared family meals related to the nutritional health of children and adolescents?," *Pediatrics*, 127 (6), e1565-e74.
- Harrington, Robert J (2007), *Food and wine pairing: A sensory experience*: John Wiley & Sons.
- Hasford, Jonathan, Blair Kidwell, and Virginie Lopez-Kidwell (2018), "Happy Wife, Happy Life: Food Choices in Romantic Relationships," *Journal of Consumer Research*, 44 (6), 1238-56.
- Hawley, Kristy L., Christina A. Roberto, Marie A. Bragg, Peggy J. Liu, Marlene B. Schwartz, and Kelly D. Brownell (2013), "The science on front-of-package food labels," *Public Health Nutrition*, 16 (3), 430-39.
- Haws, Kelly L., Scott W. Davis, and Utpal M. Dholakia (2016), "Control over what? Individual differences in general versus eating and spending self-control," *Journal of Public Policy & Marketing*, 35 (1), 37-57.
- Haws, Kelly L. and Peggy J. Liu (2016), "Combining food type (s) and food quantity choice in a new food choice paradigm based on vice-virtue bundles," *Appetite*, 103, 441-49.
- Haws, Kelly L., Peggy J. Liu, Steven K. Dallas, John Cawley, and Christina A. Roberto (2020), "Any Size for a Dollar: The Effect of Any-Size-Same-Price Versus Standard Pricing on Beverage Size Choices," *Journal of Consumer Psychology*, 30 (2), 392-401.
- Haws, Kelly L., Peggy J. Liu, Joseph P. Redden, and Heidi J. Silver (2017), "Exploring the Relationship Between Varieties of Variety and Weight Loss: When More Variety Can Help People Lose Weight," *Journal of Marketing Research*, 54 (4), 619-35.
- Henrich, Joseph, Steven J. Heine, and Ara Norenzayan (2010), "Most people are not WEIRD," *Nature*, 466 (7302), 29-29.
- Hetherington, Marion M. (1998), "Taste and appetite regulation in the elderly," *Proceedings of the Nutrition Society*, 57 (4), 625-31.
- Hetherington, Marion M., Annie S. Anderson, Geraldine N. M. Norton, and Lisa Newson (2006), "Situational effects on meal intake: A comparison of eating alone and eating with others," *Physiology & Behavior*, 88 (4-5), 498-505.
- Higgs, Suzanne (2015), "Social norms and their influence on eating behaviours," *Appetite*, 86, 38-44.

- Higgs, Suzanne and Morgan Woodward (2009), "Television watching during lunch increases afternoon snack intake of young women," *Appetite*, 52 (1), 39-43.
- Hildebrand, Diogo, R. Dustin Harding, and Rhonda Hadi (2019), "Culturally contingent cravings: how holistic thinking influences consumer responses to food appeals," *Journal of Consumer Psychology*, 29 (1), 39-59.
- Hock, Stefan J. and Rajesh Bagchi (2018), "The impact of crowding on calorie consumption," *Journal of Consumer Research*, 44 (5), 1123-40.
- Holden, Stephen S., Natalina Zlatevska, and Chris Dubelaar (2016), "Whether smaller plates reduce consumption depends on who's serving and who's looking: a meta-analysis," *Journal of the Association for Consumer Research*, 1 (1), 134-46.
- Hollands, Gareth J., Ian Shemilt, Theresa M. Marteau, Susan A. Jebb, Hannah B. Lewis, Yinghui Wei, . . . David Ogilvie (2015), "Portion, package or tableware size for changing selection and consumption of food, alcohol and tobacco," *Cochrane database of systematic reviews* (9).
- Inman, J. Jeffrey, Margaret C. Campbell, Amna Kirmani, and Linda L. Price (2018), "Our vision for the Journal of Consumer Research: It's all about the consumer," *Journal of Consumer Research*, 44 (5), 955-59.
- Khare, Adwait and J. Jeffrey Inman (2006), "Habitual Behavior in American Eating Patterns: The Role of Meal Occasions," *Journal of Consumer Research*, 32 (4), 567-75.
- (2009), "Daily, week-part, and holiday patterns in consumers' caloric intake," *Journal of Public Policy & Marketing*, 28 (2), 234-52.
- Kosıte, Daina, Laura M. König, Katie De-Loyde, Ilse Lee, Emily Pechey, Natasha Clarke, . . . Theresa M. Marteau (2019), "Plate size and food consumption: a pre-registered experimental study in a general population sample," *International Journal of Behavioral Nutrition and Physical Activity*, 16 (1), 1-9.
- Krishna, Aradhna and Linda Hagen (2019), "Out of proportion? The role of leftovers in eating-related affect and behavior," *Journal of Experimental Social Psychology*, 81, 15-26.
- Kruger, Jessica Sloan and DJ Kruger (2015), "The impact of alcohol consumption on food choices among college students," *American Journal of Health Studies*, 30 (2), 70-73.
- Lange, Christine, Camille Schwartz, Célia Hachefa, Yann Cornil, Sophie Nicklaus, and Pierre Chandon (2020), "Portion size selection in children: Effect of sensory imagery for snacks varying in energy density," *Appetite*, 150 (July), 104656.
- Lappalainen, R., L. Mennen, L. Van Weert, and H. Mykkänen (1993), "Drinking water with a meal: a simple method of coping with feelings of hunger, satiety and desire to eat," *European Journal of Clinical Nutrition*, 47 (11), 815-19.
- Laran, Juliano and Anthony Salerno (2013), "Life-history strategy, food choice, and caloric consumption," *Psychological Science*, 24 (2), 167-73.

- Larson, Jeffrey S., Joseph P. Redden, and Ryan S. Elder (2014), "Satiation from sensory simulation: Evaluating foods decreases enjoyment of similar foods," *Journal of Consumer Psychology*, 24 (2), 188-94.
- Liu, Peggy J., Steven K. Dallas, and Gavan J. Fitzsimons (2019a), "A Framework for Understanding Consumer Choices for Others," *Journal of Consumer Research*, 46 (3), 407-34.
- Liu, Peggy J. and Kelly L. Haws (2020), "Cutting Calories: The Preference for Lower Caloric Density Versus Smaller Quantities Among Restrained and Unrestrained Eaters," *Journal of Marketing Research*, 57 (5), 948-65.
- Liu, Peggy J., Kelly L. Haws, Cait Lambertson, Troy H. Campbell, and Gavan J. Fitzsimons (2015), "Vice-Virtue Bundles," *Management Science*, 61 (1), 204-28.
- Liu, Peggy J., Kelly L. Haws, Karen Scherr, Joseph P. Redden, James R. Bettman, and Gavan J. Fitzsimons (2019b), "The Primacy of 'What' Over 'How Much': How Type and Quantity Shape Healthiness Perceptions of Food Portions," *Management Science*, 65 (7), 3353-81.
- Liu, Peggy J., Brent McFerran, and Kelly L. Haws (2020), "Mindful Matching: Ordinal Versus Nominal Attributes," *Journal of Marketing Research*, 57 (1), 134-55.
- Liu, Peggy J. and Kate E. Min (2020), "Where Do You Want to Go for Dinner? A Preference Expression Asymmetry in Joint Consumption," *Journal of Marketing Research*, 57 (6), 1037-54.
- Liu, Peggy J., Jessica Wisdom, Christina A. Roberto, Linda J. Liu, and Peter A. Ubel (2014), "Using behavioral economics to design more effective food policies to address obesity," *Applied Economic Perspectives and Policy*, 36 (1), 6-24.
- Livingston, Edward H. and Jody W. Zylke (2012), "Progress in obesity research: reasons for optimism," *JAMA*, 308 (11), 1162-64.
- Lowe, Michael L. and Kelly L. Haws (2014), "(Im)moral support: the social outcomes of parallel self-control decisions," *Journal of Consumer Research*, 41 (2), 489-505.
- Lynch, John G. (1982), "On the external validity of experiments in consumer research," *Journal of Consumer Research*, 9 (3), 225-39.
- (1983), "The role of external validity in theoretical research," *Journal of Consumer Research*, 10 (1), 109-11.
- (1999), "Theory and external validity," *Journal of the Academy of Marketing Science*, 27 (3), 367-76.
- McFerran, Brent, Darren W. Dahl, Gavan J. Fitzsimons, and Andrea C. Morales (2010), "I'll have what she's having: Effects of social influence and body type on the food choices of others," *Journal of Consumer Research*, 36 (6), 915-29.
- Morales, Andrea C., On Amir, and Leonard Lee (2017), "Keeping it real in experimental research—Understanding when, where, and how to enhance realism and measure consumer behavior," *Journal of Consumer Research*, 44 (2), 465-76.

Mukhopadhyay, Anirban and Gita Venkataramani Johar (2009), "Indulgence as self-reward for prior shopping restraint: A justification-based mechanism," *Journal of Consumer Psychology*, 19 (3), 334-45.

NIAA (2021), "Alcohol Facts and Statistics," <https://www.niaaa.nih.gov/publications/brochures-and-fact-sheets/alcohol-facts-and-statistics>.

Nikolova, Hristina Dzhogleva and J. Jeffrey Inman (2015), "Healthy Choice: The Effect of Simplified Point-of-Sale Nutritional Information on Consumer Food Choice Behavior," *Journal of Marketing Research*, 52 (6), 817-35.

Okada, Erica Mina (2019), "Differential construal of exercise versus diet and implications for weight control," *Journal of Consumer Research*, 46 (3), 528-44.

Petty, Amanda J., Kathleen J. Melanson, and Geoffrey W. Greene (2013), "Self-reported eating rate aligns with laboratory measured eating rate but not with free-living meals," *Appetite*, 63, 36-41.

Raghunathan, Rajagopal, Rebecca Walker Naylor, and Wayne D. Hoyer (2006), "The unhealthy= tasty intuition and its effects on taste inferences, enjoyment, and choice of food products," *Journal of Marketing*, 70 (4), 170-84.

Redden, Joseph and Kelly Haws (2013), "Healthy satiation: The role of decreasing desire in effective self-control," *Journal of Consumer Research*, 39 (5), 1100-14.

Renner, Britta, Gudrun Sproesser, Stefanie Strohbach, and Harald T. Schupp (2012), "Why we eat what we eat. The Eating Motivation Survey (TEMS)," *Appetite*, 59 (1), 117-28.

Rishika, Rishika, Sven Feurer, and Kelly L. Haws (2021), "Really Rewarding Rewards: Strategic Licensing in Long-Term Healthy Food Consumption," *Journal of Consumer Research*, forthcoming.

Robinson, Eric, Ashleigh Haynes, Charlotte A Hardman, Eva Kemps, Suzanne Higgs, and Andrew Jones (2017), "The bogus taste test: Validity as a measure of laboratory food intake," *Appetite*, 116, 223-31.

Rolland-Cachera, Marie-Françoise, Tim J Cole, Michel Sempe, Jean Tichet, Claude Rossignol, and A Charraud (1991), "Body Mass Index variations: centiles from birth to 87 years," *European Journal of Clinical Nutrition*, 45 (1), 13-21.

Rolls, Barbara J., Edmund T. Rolls, Edward A. Rowe, and Kevin Sweeney (1981), "Sensory specific satiety in man," *Physiology & Behavior*, 27 (1), 137-42.

Rozin, Paul, Julia M. Hormes, Myles S. Faith, and Brian Wansink (2012), "Is Meat Male? A Quantitative Multimethod Framework to Establish Metaphoric Relationships," *Journal of Consumer Research*, 39 (3), 629-43.

Schwartz, Janet, Jason Riis, Brian Elbel, and Dan Ariely (2012), "Inviting Consumers To Downsize Fast-Food Portions Significantly Reduces Calorie Consumption," *Health Affairs*, 31 (2), 399-407.

Scott, Maura L., Stephen M. Nowlis, Naomi Mandel, and Andrea C. Morales (2008), "The effects of reduced food size and package size on the consumption behavior of restrained and unrestrained eaters," *Journal of Consumer Research*, 35 (3), 391-405.

- Seiler, Stephan, Anna Tuchman, and Song Yao (2021), "The impact of soda taxes: Pass-through, tax avoidance, and nutritional effects," *Journal of Marketing Research*, 58 (1), 22-49.
- Sevilla, Julio, Mathew S. Isaac, and Rajesh Bagchi (2018), "Format neglect: how the use of numerical versus percentage rank claims influences consumer judgments," *Journal of Marketing*, 82 (6), 150-64.
- Stanton, John L. and Louis A. Tucci (1982), "The measurement of consumption: a comparison of surveys and diaries," *Journal of Marketing Research*, 19 (2), 274-77.
- Steffel, Mary and Elanor F. Williams (2018), "Delegating Decisions: Recruiting Others to Make Choices We Might Regret," *Journal of Consumer Research*, 44 (5), 1015-32.
- Stroebele, Nanette and John M. De Castro (2004), "Effect of ambience on food intake and food choice," *Nutrition*, 20 (9), 821-38.
- Suher, Jacob, Szu-chi Huang, and Leonard Lee (2019), "Planning for Multiple Shopping Goals in the Marketplace," *Journal of Consumer Psychology*, 29 (4), 642-51.
- Swinburn, Boyd A., Gary Sacks, Kevin D. Hall, Klim McPherson, Diane T. Finegood, Marjory L. Moodie, and Steven L. Gortmaker (2011), "The global obesity pandemic: shaped by global drivers and local environments," *The Lancet*, 378 (9793), 804-14.
- Tangari, Andrea Heintz, My Bui, Kelly L. Haws, and Peggy J. Liu (2019), "That's Not So Bad, I'll Eat More! Backfire Effects of Calories-per-Serving Information on Snack Consumption," *Journal of Marketing*, 83 (1), 133-50.
- Van Heerde, Harald J., Christine Moorman, C. Page Moreau, and Robert W. Palmatier (2021), "Reality check: Infusing ecological value into academic marketing research," *Journal of Marketing*, 85 (2), 1-13.
- VanEpps, Eric M., Julie S. Downs, and George Loewenstein (2016), "Advance Ordering for Healthier Eating? Field Experiments on the Relationship between the Meal Order–Consumption Time Delay and Meal Content," *Journal of Marketing Research*, 53 (3), 369-80.
- Vartanian, Lenny R., C. Peter Herman, and Janet Polivy (2007), "Consumption stereotypes and impression management: How you are what you eat," *Appetite*, 48 (3), 265-77.
- Vosgerau, Joachim, Irene Scopelliti, and Young Eun Huh (2020), "Exerting Self-Control ≠ Sacrificing Pleasure," *Journal of Consumer Psychology*, 30 (1), 181-200.
- Wansink, Brian and Pierre Chandon (2014), "Slim by design: Redirecting the accidental drivers of mindless overeating," *Journal of Consumer Psychology*, 24 (3), 413-31.
- Wells, Gary L. and Paul D. Windschitl (1999), "Stimulus sampling and social psychological experimentation," *Personality and Social Psychology Bulletin*, 25 (9), 1115-25.
- Werle, Carolina O.C., Olivier Trendel, and Gauthier Ardito (2013), "Unhealthy food is not tastier for everybody: The “healthy= tasty” French intuition," *Food Quality and Preference*, 28 (1), 116-21.
- Wertebroch, Klaus (1998), "Consumption Self-Control by Rationing Purchase Quantities of Virtue and Vice," *Marketing Science*, 17 (4), 317-37.

Williamson, Sara, Lauren G. Block, and Punam A. Keller (2016), "Of waste and waists: The effect of plate material on food consumption and waste," *Journal of the Association for Consumer Research*, 1 (1), 147-60.

Winterich, Karen Page and Kelly L. Haws (2011), "Helpful Hopefulness: The Effect of Future Positive Emotions on Consumption," *Journal of Consumer Research*, 38 (3), 505-24.

Woolley, Kaitlin and Ayelet Fishbach (2019), "Shared Plates, Shared Minds: Consuming From a Shared Plate Promotes Cooperation," *Psychological Science*, 30 (4), 541-52.

Yamim, Amanda P., Robert Mai, and Carolina O.C. Werle (2020), "Make it hot? How food temperature (mis) guides product judgments," *Journal of Consumer Research*, 47 (4), 523-43.

Yang, Yang, Yangjie Gu, and Jeff Galak (2017), "When it could have been worse, it gets better: How favorable uncertainty resolution slows hedonic adaptation," *Journal of Consumer Research*, 43 (5), 747-68.

Yoquinto, Luke (2011), "25% of Calories Now Come from Snacks," LiveScience (June 24), (accessed October 4, 2021), Available at: <http://www.livescience.com/14769-snacking-calories-increase.html>.

TABLE 1: “FREE-LIVING EATING” VERSUS “LAB EATING”

	“Free-Living Eating”	“Lab Eating”	Incorporating “Free-Living Eating” Factors in “Lab Eating” Studies*
Who?	<ul style="list-style-type: none"> • People vary widely in demographic and other personal characteristics (e.g., BMI) and dietary preferences. • People eat in isolation and total anonymity; are only “watched” by the server, cook, or chef who prepared the meal; or are watched by significant others (friends, partners, family members, caregivers). • People (or their family members) typically dispose of their own food or wash their own dishes. • With whom? Typically, when eating with others, these people include friends, family members, and/or coworkers, and one can see what the others are eating and talk to them. Other people, often strangers, may be eating in the same environment; and the individual can see what they are eating but often they don’t directly interact. • With whom? People often eat multiple foods from containers that they and other people (e.g., friends, family members) are also consuming from (i.e., shared plates or a shared pantry). • For whom? People choose for themselves as well as for other people at times. • By whom? The person or a family member likely paid for, and very likely shopped for and prepared what they are eating. 	<ul style="list-style-type: none"> • Ps** are typically young (mostly undergraduates 18-22 years old), in the normal BMI range, literate (often highly educated), from western culture (with western dietary preferences), and relatively high socioeconomic status. • In terms of the influence of others, Ps know that they, or at least their choices, are being “watched” by an authority figure (the experimenter), but often no one else. • Ps do not often dispose of their own food or wash their own dishes, and someone they don’t know will do this for them (an experimenter). • With whom? Typically, alone. Other people, typically strangers, are eating at the same time and in the same place as Ps, although it is likely that Ps can’t see what they are doing or talk to them. • With whom? Ps typically eat a portion of a single food from a container that only they can consume from. • For whom? If choices about what to eat or how much are made, they are almost always for oneself. • By whom? Ps rarely pay for, and very unlikely shopped for or prepared what they are eating. 	<ul style="list-style-type: none"> • Consider recruiting more varied samples both within and across studies to include both normal weight and overweight/obese Ps as well as a wider range of age, race/ethnicity, cultures, and socioeconomic status. Consider testing for main effects or boundary conditions using these factors. • Consider varying whether others are present during eating decisions. Minimize the feeling of “being watched” by the experimenter when this is not the purpose of the study. • Consider using self-disposal within the lab setting. • Consider conducting studies with dyads/groups and make it clear in the reporting whether Ps know with whom they are eating. • Consider conducting studies with dyads/groups and allow sharing of multiple foods or eating from a common serving dish or plate. • Consider varying whether choices differ when made for themselves versus for others. • Consider increasing the level of incentive-compatibility, e.g., by providing a budget from which food choices will be made.
What?	<ul style="list-style-type: none"> • People can choose what they will eat from a wide range of options, including niche, culture, or individual-specific dishes or food flavors. They can choose more than one type of food, the 	<ul style="list-style-type: none"> • Ps either do not have a choice about what they are eating, or they have a very small choice set, often two options which represent a binary choice (e.g., healthy vs. not healthy) of broad appeal food dishes and flavors. 	<ul style="list-style-type: none"> • Consider broadening the number and range of options available to Ps to better represent typical eating decisions. Consider customizing choice sets provided to specific tastes of the participant.

	<p>condiments or other food or beverages they will eat with their food.</p> <ul style="list-style-type: none"> • People typically have access to a beverage of their choice, simultaneously while eating. • People generally have access to information on what they are eating, especially if the food was prepared at home, such as price, nutrition facts, ingredient list, health or nutrition claims but also brand name and description. For nutrition and regulated claims, this information is accurate. • The wider array of foods varies in preparation difficulty (e.g., including hot/cold foods). 	<ul style="list-style-type: none"> • Ps typically do not have access to a beverage simultaneously while eating. • Ps have access to limited information on what they are eating (e.g., they are often not given the packaging, ingredient list, price, brand, etc.). At times this information might be purposely misleading. • The limited set usually consists of easy to provide/prepare foods (e.g., room-temperature, non-refrigerated snacks). 	<ul style="list-style-type: none"> • Provide Ps with easy access to water during lab eating or consider examining the interactions between eating and drinking behaviors (including with alcohol). • When possible, consider including the same level and type of information that Ps are most likely to encounter in everyday environments, including branding and nutritional information. • Consider including options served hot or cold in research studies.
Where?	<ul style="list-style-type: none"> • People eat at the place of their choosing whether it be at home (or a table, at their desk, or on the couch), work, a restaurant, in their cars, or otherwise. • People eat in the presence of a wide range of ambient factors including the décor, lighting, noise level, views, and other atmospheric elements. • People are often eating in distracting environments (e.g., watching TV or phones, conversing with others, working on their computers, driving, etc.). • When eating occurs at home or in restaurants, it often occurs at a table setting with utensils and other typical table and serving items. 	<ul style="list-style-type: none"> • Ps are asked to come to a specific location, typically a research lab of a research university, and eat at a computer or other workstation. • Ps eat in a tightly controlled environment intended to hold atmospheric elements constant or manipulate specific atmospheric elements to represent levels of interest to the research question. • Ps are typically eating either in a distraction-free environment or are asked to perform a specific distracting task (completing other studies; watching a film clip) while eating; distraction is low or held constant. • Ps may not have utensils and other typical table or serving items or have, at best, disposable tableware. 	<ul style="list-style-type: none"> • Attempt to create as typical of an eating environment as possible and/or test effects in at least 2-3 different set-ups within the lab. Attempt to recreate public versus private consumption scenarios to the extent possible. • When studying food decisions without an emphasis on specific atmospheric elements, considering demonstrating that effects hold both in sparse lab environments as well as more typical daily eating environments. • Consider incorporating typical distractions while Ps are eating. • Provide disposable utensils (or reusable utensils with proper sanitation protocols) and other serving items that best reflect the eating decision environment in real life.
When?	<ul style="list-style-type: none"> • People are eating during and outside business hours (e.g., eating in the late evening, on weekends, on holidays, etc.) • People arrive at a situation often knowing (and planning) that they will be eating. They have often made a free choice to begin eating. 	<ul style="list-style-type: none"> • Ps are eating primarily during business hours or are otherwise constrained to the timing of the study. • Ps arrive at a situation unaware that and/or what they will be eating, or aware that they will be eating (and hungry) because they were asked to fast. They have rarely made a free choice to begin 	<ul style="list-style-type: none"> • Consider intentionally conducting lab eating studies at varying times of the day and on both weekdays and weekends. • Unless the primary purpose of study is to determine responses to spontaneous opportunities to eat, inform participants in advance that the study will involve food consumption, and consider telling them what the food(s) will be.

	<ul style="list-style-type: none"> • People make eating choices for both immediate consumption (from pantry or refrigerator or restaurant menu) or for consumption at a later point (e.g., putting aside food for later consumption, cooking ahead of time). • People can choose not to eat in any given situation. • People’s choices or consumption in the current situation are affected by previous choices and/or subsequent choices. 	<p>eating, having been asked by an authority figure (i.e., the experimenter) to do so.</p> <ul style="list-style-type: none"> • Ps make choices primarily for immediate consumption. • Ps are often compelled to make choices or feel obligated to eat in research studies. • Ps choices are rarely linked to any of their past choices. Future choices are rarely assessed. 	<ul style="list-style-type: none"> • Include choices about foods that will not be consumed until a future point in time. • Include no-choice options where possible. • Collect information about potentially relevant previous or future consumption. Potentially follow-up to capture consumption later in the day following the lab eating study.
Why?	<ul style="list-style-type: none"> • People are influenced by a wide range of physiological, psychological, social, emotional, and environmental motivations driving eating behaviors. In some cases, people may eat rather mindlessly, without paying attention to their eating behavior. 	<ul style="list-style-type: none"> • Although hunger often plays a role, in many cases Ps are eating because they are asked to do so or feel obligated to do so, which may influence their food choices. Self-presentation and ingratiation goals may be salient. People may eat more mindfully. 	<ul style="list-style-type: none"> • At a minimum, assess current level of hunger during lab eating and ideally general attitudes towards eating (dieting status, restrained eating tendencies, food allergies, etc.). Strive to provide a safe space in which participants do not feel judged (e.g., choices are only measured at the aggregate level). Only conduct eating studies among Ps who feel like eating.
How much?	<ul style="list-style-type: none"> • People may eat from either a pre-defined and fairly small one-serving portion size or a very large and undefined portion size. • Leftovers are for people to decide how to deal with, and one can save them to eat for later, share them with someone else, or discard them. 	<ul style="list-style-type: none"> • Ps typically have little choice in terms of the portion size to eat from unless portion size choice is a primary aim of the study. • Leftovers often remain at the study, and Ps cannot hide them, save them to eat for later, or share them with someone else. 	<ul style="list-style-type: none"> • When possible, Ps should be provided with options in terms of the amount of the food(s) available to them. • Provide the opportunity for Ps to save and consume food at a later point in time, ideally coupled with collecting information about subsequent consumption.

Notes.

*The recommendations for “free-living” factors into “lab eating” contexts depend upon the main objectives of the researcher and would not necessarily apply across all studies.

**Ps refers to participants in research studies

TABLE 2: RESEARCH EATING METHODS THAT GO BEYOND THE LAB

Method	Key Examples*	Existing Advantages and/or Opportunities for Improvement
Field studies or experiments	Dubois et al. (2021); Sevilla et al. (2018)	<ul style="list-style-type: none"> • Recruit consumers shortly after they have made real food decisions—captures real behavior although can be subject to recall biases • Record actual consumption • Use to confirm purchase effects of interventions or theories tested in lab or online • Design to balance realism and control of extraneous environmental factors • Examine real interventions using real consumers in real purchase decisions, over time
Purchase data, grocery stores	Ailawadi et al. (2018); Nikolova and Inman (2015)	<ul style="list-style-type: none"> • Capture actual purchases, sometimes across different retail outlets • Focus on household patterns • Utilize single-person households to focus on decisions for the self only • Examine patterns of behavior over time • Add follow-up surveys to track or estimate consumption
Purchase data, restaurants	Hock and Bagchi (2018); VanEpps, Downs, and Loewenstein (2016)	<ul style="list-style-type: none"> • Capture real choices of multiple foods in single time period, which could be enhanced by including consumption measurements • Utilize university or workplace cafeteria environments • Can track online ordering patterns
24-hour dietary recalls	Haws et al. (2017); Stanton and Tucci (1982)	<ul style="list-style-type: none"> • Include time and place of eating, generating enhanced understanding of “when to start” drivers • Extend the period under study, increase the number of days during period that are recorded • Couple with interventions to track effects
Food diaries, visual food diaries, or self-reports of actual consumption	Emich and Pyone (2018); Khare and Inman (2006, 2009)	<ul style="list-style-type: none"> • Include time and place of eating recorded by participant, subject to error and quantity biases • Use visual recording of food consumption to enhance accuracy of both food type and quantity (particularly using before and after pictures) • Add simplified version of food diary and recall to other studies to verify effect of any manipulations on subsequent consumption • Use technological devices for recording activity and food consumption
Hybrid field and lab studies	Gough et al. (2021)	<ul style="list-style-type: none"> • Field studies with remote experimental control: Send food to people’s homes and control the procedure remotely via video conferencing tools like Zoom or ProctorU. • Living labs: Semi-naturalistic laboratory settings furnished and designed to mimic the natural eating environment (e.g., home or restaurant).

Note. * Denotes that this method was used in this paper in at least one study, not that this was the only method used in the paper.

TABLE 3: SAMPLE RESEARCH OBJECTIVES AND RECOMMENDED METHODS

Sample Research Objectives*	Recommended Method(s)	Considerations Regarding Mapping to Free-Living Eating Background Factors
Causal aim: Understand if there is a causal effect of factor X on eating in isolation, holding all else constant without confounds	Lab eating	Record the “who,” “what,” and “why” and clearly acknowledge these gaps compared to free-living eating. Consider “how much” as another eating outcome. The gap between lab eating and free-living eating is less of a concern in this case, so long as claims are not overstated.
Theory aim: Testing a theory (food context is not central to the objective, but an appropriate realistic choice context)	Lab eating	Control and record the “who,” “what,” “when,” “where,” and “why,” ensuring that the stimuli used are relevant to the theoretical research question through stimulus testing.
Pilot aim: Piloting potential effect size for a future more intensive field study, given practical constraints	Lab eating	Record the “who,” “what,” “when,” “where,” and “why” and consider measuring “how much.” Try to map each of these characteristics on to the intended field setting as much as possible.
Real-world effect size aim: Determine if an effect exists in some real-world setting (i.e., ecological validity) and if so, its effect size (important for determining intervention effectiveness under specific circumstances of “who” and “where” especially)	Field setting	Record the “who,” “what,” “when,” “where,” and “why” and consider measuring “how much.” Note that effect sizes likely also vary by field settings and thus recording and sharing the 5Ws and H is also important.
Convenience aim: Study something that is challenging to study in the lab, such as drinking alcohol	Field setting	Consider exploiting natural variations in a quasi-experiment (e.g., sample people before or after exiting a bar) or conducting studies in a safe and appropriate setting (e.g., university cafeterias serving reasonable quantities of alcohol). Record the “who,” “what,” “when,” “where,” and “why” and consider measuring “how much.”
External validity aim and/or boundary condition aim: Attempt to establish the generalizability of an effect (or boundary conditions) through testing it in multiple situations.	Multi-methods	Measure or manipulate potential moderators in terms of “who,” “what,” “when,” “where,” and “why” in both tightly controlled lab experiments and free-living studies. Consider adding correlational data from observational or other secondary data sources.

Note. * We acknowledge that these are but some examples of various objectives that researchers may have when conducting food decision-making studies, and that in many cases, there are multiple objectives for the same research project.