# Why Do People Eat the Same Breakfast Every Day?

# Goals and Circadian Rhythms of Variety Seeking in Meals

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**Abstract.** People exhibit a circadian rhythm in the variety of foods they eat. Many people happily eat the same foods for breakfast day after day, yet seek more variety in the foods they eat for lunch and dinner. We identify psychological goals as a driver of this diurnal pattern of variety seeking, complementing other biological and cultural drivers. People are more likely to pursue hedonic goals for meals as the day progresses, which leads them to seek more variety for dinners and lunches than breakfasts. We find evidentiary support for our theory in studies with French and American participants ($N$ = 4,481) using diary data, event reconstruction methods, and experiments. Both endogenously and exogenously induced variation in hedonic goal activation modulates variety seeking in meals across days. Hedonic goal activation predicts variety seeking for meals when controlling for factors including time devoted to meal preparation and eating, the presence or absence of other people, and whether people ate a meal inside or outside their home. Goal activation also explain differences in time spent on meals, whereas increasing time spent on meals does not increase variety seeking. Finally, we observed that a similar increase in hedonic goal activation enacts a larger increase in variety seeking at breakfast than at lunch than at dinner, suggesting a diminishing marginal effect of hedonic goal activation on variety seeking.

***Keywords:*** breakfast, variety seeking, hedonic goal, eating, circadian rhythm

## 1. Introduction

People exhibit a circadian rhythm in the variety of foods they eat. Many people who choose to eat the same breakfast each day seek variety in their lunches and dinners (Khare & Inman, 2006). Why do the same people fluctuate so much in their variety seeking, in the same appetitive domain, even within the same day? Factors ranging from culture to biology contribute to this diurnal pattern of variety seeking (Khare & Inman, 2006). We have identified a novel and complementary psychological driver: diurnal variance in the pursuit of hedonic and utilitarian goals across meals. We propose that people are relatively more likely to pursue hedonic goals as the day progresses, with utilitarian goals most active in the morning and hedonic goals most active in the evening. This difference in goal activation modulates the variety they seek for meals. In food diary data, event reconstruction studies, and experiments, we tested whether natural and experimentally induced variation in hedonic versus utilitarian goal activation helps explain why people seek less variety across days for their breakfasts than for their lunches and dinners.

### *1.1 Circadian Rhythms in Meals and Goals*

Circadian rhythms are patterns that manifest in many physical, psychological, and behavioral domains over the course of a 24-hour cycle (e.g., Bodenhausen, 1990; Panda, 2016). One peculiar circadian rhythm exists in the domain of food. Within the same person, appetitive domain, and day, there is substantial disparity in variety seeking across meals. People more often eat the same breakfast each day than the same lunch or dinner (Khare & Inman, 2006). One driver of this diurnal variation is a cultural constraint. Capitalist labor practices allow many people less time to select, prepare, and consume their breakfasts than their lunches or dinners (Khare & Inman, 2006). They thus have time to prepare and eat fewer combinations of food at breakfast than at lunch and dinner. A biological driver also contributes to this diurnal variation.

Physiological arousal increases according to a concave function throughout the day, and people seek to optimize their stimulation level by matching the arousing effects of variety to the level of arousal they are currently feeling (Gullo, Berger, Etkin, Bollinger, & Morales, 2019).

We suggest a complementary (and malleable) intermediary psychological driver. We suggest there is substantial diurnal variation in the goals that people pursue for breakfast, lunch, and dinner and that this helps explain why people pursue different levels of variety seeking in meals across days. We adopted an item-based definition of variety seeking across days. For each person (*i*), we examined how many times the exact combination of foods consumed at meal *m* on day *d* was consumed on other days of the week. If Elizabeth Alexandra Mary Windsor ate Special K and a fruit salad for breakfast on Monday, for instance, how many other times did that queen eat that combination of foods for breakfast that week? We acknowledge that this is one of many ways to measure variety seeking, which includes variance in the nutritional content of foods eaten (Khare & Inman, 2006), types of cuisines eaten (e.g., pasta, Haws, Liu, Redden, & Silver, 2017), and perceptions of variety (Hoch, Bradlow, & Wansink, 1999).

Goals drive many decisions about what people eat. Two that are prevalent in decisions about food are hedonic and utilitarian goals (Dhar & Wertenbroch, 2000). Hedonic experiences are characterized as pleasurable and sensorial. Hedonic goals are pursued to produce hedonic experiences and the pleasurable sensations, affective states, and emotions they produce (Hirschman & Holbrook, 1982). In contrast, utilitarian experiences are more often characterized as useful and functional. Utilitarian goals are often pursued to fulfill a superordinate goal, as a means to an end, such as eating a particular food to facilitate weight control (Stroebe, Mensink, Aarts, Schut, & Kruglanski, 2008), optimize long-term health (Belei, Geyskens, Goukens, Ramanathan, & Lemmink, 2012), or maximize short-term performance (Gildersleeve, 2012; Loebnitz & Grunert, 2018). People pursuing a hedonic goal might have a milkshake to

experience the cold, sweet, rewarding sensations it produces in their body, for instance, whereas those pursuing a utilitarian goal might eat a meal-replacement shake to help them control their weight. Hedonic and utilitarian goals are frequently in conflict when eating (Dhar & Wertenbroch, 2000), which often requires people to make trade-offs between maximizing pleasure and satisfying more utilitarian goals.

### *1.2 The Present Research*

We suggest there is a circadian rhythm in the relative activation of hedonic versus utilitarian goals within the day. Long-term dietary goals may be active throughout the entire day but are often balanced against conflicting short-term goals (Orehek & Vazeou-Nieuwenhuis, 2013). We theorize that as the day progresses, the relative activation of utilitarian goals for eating declines, and the activation of hedonic goals increases. Consequently, for most people, hedonic goals are least active at breakfast and most active at dinner. Indirect support for our assumption from the literature includes research findings that indicate people more frequently exhibit the kind of self-control that utilitarian eating practices require in the morning than evening (Dhar & Wertenbroch, 2000; Kouchaki & Smith, 2014). Indirect evidence from practice comes from the breakfast foods featured in marketing campaigns (Bian & Markman, 2020), which tend to fulfill more utilitarian than hedonic goals. We have also found marketers emphasize the utilitarian rather than hedonic benefits of breakfast foods in observational pilot studies of online food manufacturers (Pilot Study A, Supplementary Material 1–2) and restaurant managers (Pilot Study B, Supplementary Material 3). While we hypothesize that the activation of hedonic goals increases throughout the day, we acknowledge that this increase may not be monotonic and likely to be larger at breakfast rather than at dinner. Similarly, Gullo et al. (2019) found that the increase in physiological arousal is greater in morning to midday rather than midday to evening.

Hedonic goal activation increases variety seeking (Whitley, Trudel, & Kurt, 2018). Variety helps fulfill hedonic goals by reducing the pleasure-dampening effects of satiation and habituation within and across meals (Galak & Redden, 2018). Satiation and habituation lead people to derive less pleasure from the last bite of a food than the first bite but can be slowed within the same meal by consuming by foods that actually differ or are perceived to differ (e.g., in flavor, texture, color; Redden, 2008; Rolls, Rolls, Rowe, & Sweeney, 1981). Likewise, people seek to eat a variety of meals to counteract the effects of satiation and habituation on their enjoyment of meals recently eaten (Galak, Redden, & Kruger, 2009; Garbinsky, Morewedge, & Shiv, 2014).

We argue that if people are less likely to pursue hedonic goals for their breakfasts than lunches and dinners, they should seek less variety across days in their breakfasts than in their lunches and dinners. If people are more likely to be pursuing utilitarian goals at breakfast, the pleasure enhanced by variety may be less important in their choice of foods than maximizing the efficiency of meal preparation, their health, weight control, or saving money. This "breakfast monotony" prediction complements the time-constraint driven prediction of Khare and Inman (2006). However, it stems from a distinct psychological mechanism in which time allocated to a meal is not externally constrained; instead, it is determined by goals associated with food consumption during that meal. We measured these goals, their diurnal variation, and their relationship to variety seeking.

A second related prediction was that relative variation in hedonic goal pursuit has a diminishing marginal effect on variety seeking across days from breakfast to dinner. Because the baseline of hedonic goal activation at breakfast is lower than at lunch than at dinner (i.e., breakfast < lunch < dinner), interventions increasing hedonic goal activation will produce a larger increase in variety seeking at breakfast than at lunch than at dinner (i.e., breakfast > lunch >

dinner). Indeed, in previous research on variety seeking throughout the day, Gullo, et al. (2019) found that physiological stimulation has a weaker influence on variety seeking as the day progresses. Because baseline physiological stimulation is typically lower in the morning than later in the day, the increase in variety seeking with physiological stimulation is stronger in the morning than later in the day. We suggest that, similarly, because the baseline of hedonic goal activation at breakfast is lower than at lunch than at dinner, the same increase in hedonic goal activation that might occur due to a weekend, holiday, change in diet, or marketing intervention will influence variety seeking more at breakfast than lunch, and at lunch than at dinner.

We used a mulitmethod approach testing the role of hedonic goals using natural variation in hedonic goals (e.g., weekday vs. weekend Studies 1A-B), individual variance in goals (Study 2), and experimental manipulations (Study 3), rather than solely mediation analyses, as suggested by Spencer, Zanna, and Fong (2005). We also tested whether hedonic goal activation is a substantive predictor of variety seeking in meals when controlling for previously identified covariates such as time spent on meals, the presence of other people (Ariely & Levav, 2000; Higgs, 2015), and whether food is consumed inside or outside the home (Ratner & Kahn, 2002).

The materials and procedures were approved by the Boston University Charles River Campus Institutional Review Board. Informed consent was obtained for all participants in studies involving primary data collection with human subjects. Raw data and Stata code files are available on the Open Science Framework at https://osf.io/dwx9j.

## 2. Studies 1A & 1B: Natural Variations in Hedonic Goals

In Study 1A and 1B, we tested our central prediction by exploiting endogenous variation in hedonic goal pursuit at meals. With diary data, we compared meals eaten on weekdays and on

the weekend. We assumed that people would be more likely to pursue hedonic goals when eating meals over the weekend than during weekdays. In a pretest, detailed in Supplementary Appendix 4, we found that hedonic goal activation was indeed higher on the weekend than during weekdays. While we acknowledge that a variety of factors change from week to weekend, we controlled for three important drivers in our pretest and in Studies 1B and 2: time spent on meals, the presence of others, and consumption location. We explored more factors regarding variation in hedonic goal activation from weekdays to weekend in Study 2. Moreover, we predicted the increased hedonic goal pursuit for meals over the weekend should exhibit diminishing marginal returns: it should increase variety seeking more at breakfast than at lunch than at dinner.

### *2.1 Study 1A: The Increase in Variety Seeking over the Weekend Is Stronger for Breakfast*

Study 1A drew from a large ($N$ = 1,275) sample of Americans who each provided a food diary in which they reported all meals eaten over the course of seven days. We started by statistically replicating the breakfast monotony effect found in Khare and Inman (2006), testing for lower levels of variety seeking across days at breakfast than at lunch than at dinner. We used a similar data set, but our empirical strategy differed in two important ways. First, our measures of variety seeking across days were based on the exact combination of foods consumed rather than the nutritional composition of the meal (Khare & Inman, 2006, 2009). Second, we exploited the natural increase in hedonic goals from the weekday to the weekend to examine how different levels of hedonic goal activation affect variety seeking.

#### *2.1.1 Method*

In the focal study, our analyses examined food diary data collected by the NPD Group in 2004 from a nationally representative sample of Americans. The initial sample included 1,713 respondents from 0 to 99 years old. We removed participants under 18 years of age, as their

choices are likely to be influenced by their parents, which may bound the effect (Botti & McGill, 2010). The final sample consisted of 1,275 American adults. We also limited our analysis to the first seven days of the diaries to facilitate the comparison of the results of this American sample to the French sample in Study 1B, who only recorded their meals for one week. The results are similar when including all 14 days recorded by the American sample, instead of seven (see Supplementary Material 5).

Information about six food occasions (breakfast, lunch, dinner, and three snacks) was recorded for each participant, every day for two weeks, in 2004. Due to our focus on meals, we removed snack observations (9% of the total food items consumed). Each observation captured the consumption of one food item (e.g., eggs) on a specific day *d*, for one meal *m*, for one panel member *i*. The NPD Group organized the food items in 166 categories (see Supplementary Material 6). The exclusions discussed above only slightly changed the estimates. All conclusions still hold using participants below 18, including snacks, and using the alternative categorizations from Study 1B (see Supplementary Material 5).

We measured variety seeking across days in two ways. First, we analyzed the data across days to produce a maximum of seven observations for each meal of each panel member. Our measure of variety seeking across days is a function of the number of weekly repetitions of each food combination (i.e., from one to seven repetitions) relative to the number of meals reported within the week (e.g., from one to seven breakfasts).

$$Variety_{imd} = \frac{\#\ Meals_{im} - \#\ Weekly\ Repetitions_{imd}}{\#\ Meals_{im}}$$

Specifically, we computed how many times a food combination consumed on day *d* was consumed on other days of the week for meal *m* of individual *i*. Supplementary Material 7 provides details on this disaggregated measure of variety seeking ($M$ = .71, $SD$ = .22). Minimal

variety seeking occurs when a participant eats the same combination of breakfast foods every day on seven consecutive days (min. = .00), and maximum variety seeking occurs if they eat that combination only once in seven breakfasts (max. = .86). This measure is sensitive to small variations in food consumption: close combinations are considered to differ even if meals vary by a single item (e.g., a breakfast of ham and cheese on Monday, versus a breakfast of ham and cheese and egg on Tuesday).

We also used two measures of variety seeking across days as robustness checks by examining the data at the level of meal, aggregating the seven daily observations (see details in Web Appendix 8). First, we used an aggregated measure adapted from Gullo, et al. (2019), the function of the number of unique different items consumed throughout the week and the total number of items consumed over the week. This measure ranges from 0 to 1 (i.e., no variety to maximum variety across days, respectively; $M$ = .62, $SD$ = .23). Second, we computed entropy, a measure of dispersion for categorical variables (Van Herpen & Pieters, 2002), which has been previously used to measure variety seeking (Mitchell, Kahn, & Knasko, 1995). This measure ranges from 0 to 3.23 (i.e., no variety over time to maximum variety over time; $M$ = 1.78, $SD$ = .68).

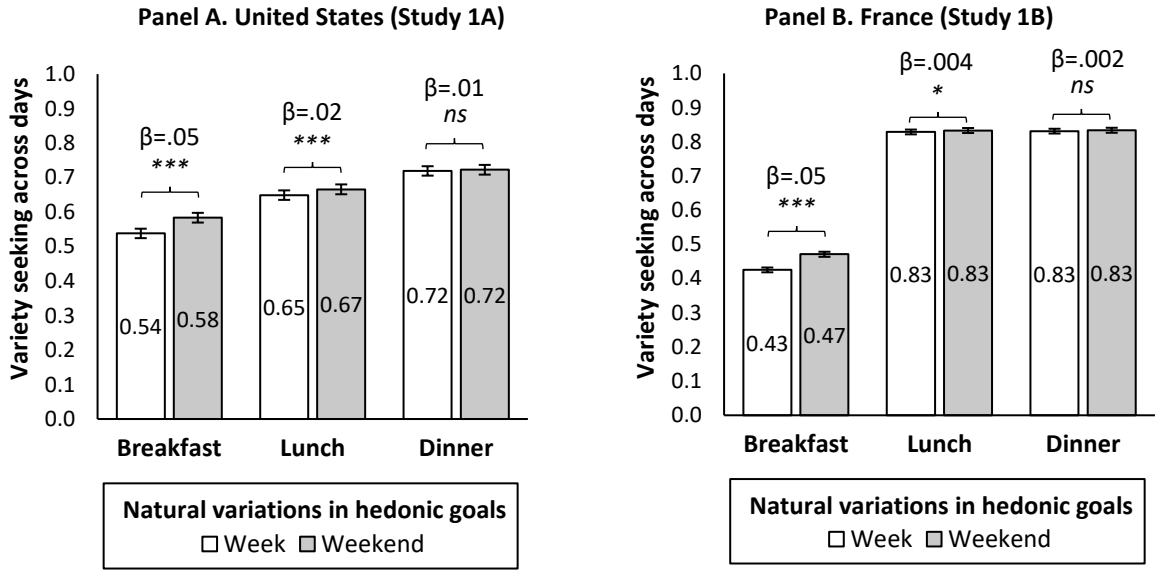
Consistent with Khare and Inman (2006), we used a multilevel model to account for the hierarchical nature of our data: day observations (level 1) are nested within meals (level 2), which, in turn, are nested within panelists (level 3). We used linear mixed-effect regressions with random intercepts at both the panelist and the meal-within-panelist levels.

*2.1.2 Results*

We began by testing for the breakfast monotony effect, examining the direct effect of meals on variety seeking across days. We estimated a regression with a nominal meal variable,

that is, two dummy variables for lunch and dinner, with breakfast serving as the reference category. The level of variety seeking was significantly lower for breakfast compared to lunch ($\beta$ = .10, $z$ = 15.70, $p$ < .001) and to dinner ($\beta$ = .17, $z$ = 26.14, $p$ < .001). The difference in variety seeking between lunch and dinner was also significant ($\beta$ = .07, $z$ = 10.22, $p$ < .001). See Supplementary Material 9 for detailed results. The effect of meals on variety seeking across days holds when using the alternative aggregated and entropy measures (Supplementary Material 5): variety seeking was significantly lower for breakfast as compared to lunch (aggregated: $\beta$ = .18, $z$ = 31.10, $p$ < .001; entropy: $\beta$ = .46, $z$ = 25.93, $p$ < .001) and to dinner (aggregated: $\beta$ = .20, $z$ = 35.61, $p$ < .001; entropy: $\beta$ = .81, $z$ = 45.86, $p$ < .001). The difference between lunch and dinner was also significant (aggregated: $\beta$ = .02, $z$ = 4.28, $p$ < .001; entropy: $\beta$ = .35, $z$ = 19.67, $p$ < .001).

**Figure 1. Declining Effect of Hedonic Goals on Variety Seeking (Studies 1A & 1B)**




Note: Bars represent 95% confidence intervals.

As a preliminary test of the declining effect of hedonic goals on variety seeking across days, we estimated a model that includes interaction terms between the meal dummy variables

and a dummy variable for weekday (0) or weekend (1; Figure 1, Panel A). Consistent with our main prediction, both interactions terms were significant (respectively, $\beta = -.03$, $z = -6.98$, $p < .001$ and $\beta = -.04$, $z = -10.54$, $p < .001$) such that the increase in variety seeking over the weekend was stronger for breakfast ($\beta = .05$, $z = 16.07$, $p < .001$). The simple effect of weekend on lunch was smaller but significant ($\beta = .02$, $z = 5.58$, $p < .001$). The simple effect of weekend was not significant for dinner ($\beta = .003$, $z = 1.21$, $p = .23$).

### *2.2 Study 1B: Cross-Cultural Replication Controlling for Meal-Level Situational Covariates*

There is certainly important cultural variation in the types of food people eat for different meals (Spence, 2017). Study 1B conceptually replicates the results from Study 1A with French participants, known to be more hedonic in their orientation toward meals and to spend more time eating than Americans (Rozin, 2005; Rozin, Remick, & Fischler, 2011). Since Khare and Inman (2006) suggested that time scarcity influences the meal variations in variety seeking, we tested in Study 1B whether the results of Study 1A hold when time spent on meals is included as a control variable. Moreover, we also tested whether our findings hold when controlling for two factors that drive the influence of social norms on food choice (e.g., Higgs, 2015), whether a meal is eaten alone or in the presence of others, and whether it is eaten in or outside of the home.

#### *2.2.1 Method*

In Study 1B, we analyzed a French ANSES food diary database with a similar design to the NPD Group database used in Study 1A. ANSES, a public organization, collected food diaries in 2006–2007 from a nationally representative sample of the French population. This INCA2 database is publicly available (ANSES, 2014) and has been used in previous nutrition research (Dubuisson, et al., 2010). The data consists of food diaries completed over a period of one week, including food consumption for three main meals and snacks. Consistent with Study 1A, we

removed snacks and participants under 18 years of age, yielding a sample of 2,624 adults. We used the same food categories and measures of variety seeking across days as used in Study 1A. As shown in Supplementary Material 10, the database includes three covariates at the meal level: duration of the meal (in minutes), whether the meal was eaten in the presence of others or alone, and the location where it was consumed (in or outside of the home). Compared to the NPD Group using 166 food categories (Study 1A), ANSES used 44 food categories (Study 1B). We recategorized the food items in Study 1A using the 44 categories from Study 1B to make the estimates from both studies more comparable. This alternative categorization did not change any of the results discussed in Study 1A.

*2.2.2 Results*

Using the same empirical strategy and covariates, we replicated the breakfast monotony effect illustrated in Supplementary Material 9. Variety seeking across days for breakfast was significantly lower compared to lunch ($\beta = .39$, $z = 80.04$, $p < .001$) and to dinner ($\beta = .39$, $z = 80.85$, $p < .001$). The difference in variety seeking between lunch and dinner was not significant ($\beta = .002$, $z = .39$, $p = .70$). These results hold when including the control variables (Supplementary Material 11, Model 2). The results also hold when using the aggregated measure of variety seeking across days (Supplementary Material 9).

As our focal test of the influence of hedonic goals on variety seeking across days, we estimated a model with the interaction terms between the meal dummy variables and the weekend dummy variable. Consistent with Study 1A, both interactions terms were significant (respectively, $\beta = –.04$, $z = –17.27$, $p < .001$ and $\beta = –.04$, $z = –18.05$, $p < .001$), such that increases in variety seeking over the weekend was greatest for breakfast ($\beta = .05$, $z = 26.74$, $p < .001$; see Figure 1, Panel B). The simple effect of weekend versus weekday was significant for

lunch ($\beta$ = .004, $z$ = 2.46, $p$ = .01), but not for dinner ($\beta$ = .002, $z$ = 1.51, $p$ = .13). When including the control variables (Supplementary Material 11, Model 3), the simple effect of weekend versus weekday was significant for breakfast ($\beta$ = .04, $z$ = 24.19, $p$ < .001), but not for lunch ($\beta$ = .001, $z$ = .44, $p$ = .66) or dinner ($\beta$ = .001, $z$ = .64, $p$ = .52).

We estimated models with three-way interactions to examine whether the control variables moderated the simple effect of weekend on variety seeking for breakfast (Supplementary Material 11, Models 4-6). The simple effect of weekend on variety seeking for breakfast was greater in the presence of others ($\beta$ = .03, $z$ = 6.92, $p$ < .001). Time spent on meals and consumption location, however, did not moderate the effect of weekday versus weekend on variety seeking for breakfast.

### *2.3 Discussion*

In two studies, we found that American and French participants exhibited less variety seeking across days for breakfast than for other meals. Moreover, consistent with our variation-in-hedonic-goals account of variety seeking, we observed the predicted increase in variety seeking for meals on weekend days relative to weekdays. This increase is most pronounced for breakfast. These results are robust across both samples and three indices of variety seeking across days and hold when including three important situational covariates.

An important limitation is that controlling for time spent on meals in Study 1B did not affect the results, but the data do not allow us to reject the alternative possibility that time spent eating drives the increase in variety seeking for breakfast on the weekend (see Supplementary Material 12). We suggest a more general sequential explanation, such that the more proximal increase in hedonic goals over the weekend makes people spend more time on breakfast (but not vice versa), which allows greater variety seeking. We could not test this serial mediation in Study

1B but designed Study 2 to allow for such a test by measuring meal goals in the week and on the weekend. As an additional direct test of the goals versus time accounts of variety seeking, we directly compared experimental manipulations of increasing hedonic goals and increasing time spent eating on variety seeking at breakfast (Supplementary Material 17).

## 3. Study 2: Measuring Hedonic Goals Using the Event Reconstruction Method

In Study 2, we extended testing of our theory by using a direct measure of the relative activation between hedonic and utilitarian goals. We used the event reconstruction method, or ERM (Schwarz, Kahneman, & Xu, 2009), adapted from the day reconstruction method, or DRM (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004). Compared to the DRM, which takes 45–75 minutes to complete, ERM is an efficient and effective method to facilitate access to episodic memory, minimize recall errors and biases, and increase the probability of precise recall (Grube, Schroer, Hentzschel, & Hertel, 2008). This design also allowed us to directly test our hypotheses using a different method.

### *3.1 Method*

Using Amazon Mechanical Turk, we recruited 199 participants residing in the United States (43% female, $M_{age}$ = 35.25, *SD* = 9.83). We asked participants, on a Tuesday, to recall eating episodes for the last two days: Monday (a weekday) and Sunday (a weekend day). We first asked participants to recall all their meals across the last two days. Participants indicated the type of each meal recalled (breakfast, lunch, dinner) and the time of consumption. Participants then rated each meal on three questions, presented in a random order: hedonic vs. utilitarian goal ("Generally, we distinguish between two food consumption goals: [a] a utilitarian goal derived from functional aspects of food or [b] a hedonic goal derived from sensory aspects of food. How

would you categorize the goal of this eating episode?" from 1 = *utilitarian* to 7 = *hedonic*), enjoyment ("How much did you enjoy this eating experience?" from 1 = *not at all* to 7 = *very much*), and the vividness of their memory ("How vividly do you remember this eating episode?" 1 = *very vague* to 7 = *very detailed*).

Next, participants recalled and wrote down the combination of foods they consumed in each episode. They then completed a variety-seeking measure, which asked, "In the last seven days, how many times have you eaten [food items reported in the previous question] for [food occasion]," rated from 1 to 7. As in studies 1A and 1B, the measure was based on the number of weekly repetitions for a food combination, only the repetitions were self-reported in the present study. We then reverse scored this measure for clarity so that variety seeking ranged from 7 as the highest magnitude of variety seeking to 1 as the lowest magnitude of variety seeking.

We also included the three control variables for each meal, as in Study 1B: (a) whether the meal was consumed in the presence or absence of others and (b) in or outside the home, and (c) the duration of the meal (from 1 = *less than 10 minutes* to 5 = *more than 40 minutes*).

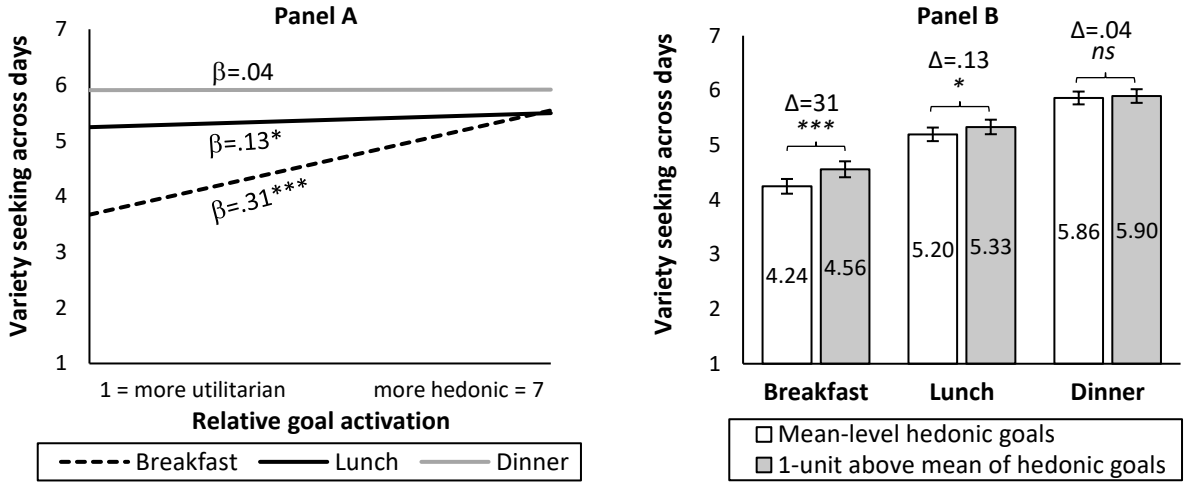
Consistent with Studies 1A and 1B, we used multilevel mixed-effects linear regression to account for the hierarchical nature of our data. Meal observations (level 1) are nested within panelists (level 2).

### *3.2 Results*

As a test of our central prediction, we estimated a regression on variety seeking across days with independent variables: meals (lunch and dinner dummy variables), hedonic goals, and their interactions. The results yielded significant interactions between hedonic goals and the meal variables (i.e., dummy variable) for lunch ($\beta = -.18$, $z = -2.60$, $p = .009$) and dinner ($\beta = -.28$, $z = -4.14$, $p < .001$). As shown in Figure 2 (Panel A), the simple effect of hedonic goals on variety

seeking across days was stronger for breakfast ($\beta$ = .31, $z$ = 5.57, $p$ < .001) than for lunch ($\beta$ = .13, $z$ = 2.85, $p$ = .004) and dinner ($\beta$ = .04, $z$ = .82, $p$ = .41). Note that the slopes for lunch and dinner are marginally different ($\beta$ = –.10, $z$ = –1.68, $p$ = .09). For illustrative purposes, we also plotted variety-seeking estimates at the mean and one unit above the mean of hedonic goals in Figure 2 (Panel B). This result shows that the same change in hedonic goals led to greater change in variety seeking for breakfast than for lunch and dinner. The results hold when controlling for weekend, time spent eating, presence of others, and consumption location. See Supplementary Material 14 for details.

**Figure 2. Declining Effect of Hedonic Goals on Variety Seeking (Study 2)**




As a second test of our central prediction, we tested for an interaction between meals and week versus weekend. The analyses yielded a significant interaction between breakfast and dinner ($\beta$ = –.61, $z$ = –2.56, $p$ = .01) but not between breakfast and lunch ($\beta$ = –.32, $z$ = –1.30, $p$ = .19). The simple effect of weekend on variety seeking was significant only for breakfast ($\beta$ = .42, $z$ = 2.21, $p$ = .03). As predicted, the simple effects decreased for lunch ($\beta$ = .09, $z$ = .57, $p$ = .57) and dinner ($\beta$ = –.19, $z$ = –1.33, $p$ = .18).

Finally, we examined whether the increase in variety seeking for breakfast over the weekend is due to a change in hedonic goals. We estimated a moderated mediation with 5,000 clustered bootstrap samples, as shown in Table 1. Consistent with our prediction, the indirect effect of weekend on variety seeking through hedonic goals was significant for breakfast ($\beta$ = .05, 95% CI [.0004, .1090]) and decreased for lunch ($\beta$ = .04, 95% CI [-.0050, .0901]) and dinner ($\beta$ = -.01, 95% CI [-.0599, .0271]).

Consistent with Study 1B, however, we also found that an increase in time spent eating mediates this effect (see Table 1, line 2). Therefore, we tested two serial mediation models with hedonic goals and time spent eating to discern the direction of the effect. As predicted, the simple effect of weekend on breakfast increased hedonic goals, which then led to longer time spent eating and then greater variety seeking (see Table 1, line 3). We also tested the causal chain by reordering the two mediators, where the longer time spent eating increased hedonic goals and then variety seeking (see Table 1, line 4). The confidence intervals for the alternative model were 0 for all three meals. Last, results from an additional mediation analysis revealed that the influence of weekday breakfast (vs. weekday other meals) on variety seeking across days was mediated by hedonic goals ($\beta$ = -.08, 95% CI [-.1084, -.0112]).

**Table 1. Variety Seeking Increases From Week To Weekend via Hedonic Goals and Time (Study 2)**

| | **Indirect effects (95% confidence interval)** | | |
|---|---|---|---|
| | **For breakfast** | **For lunch** | **For dinner** |
| 1: Meal*weekend -> goals -> variety | .0523* | .0412 | -.0147 |
| | (.0004, .1090) | (-.0095, .0901) | (-.0599, .0271) |
| 2: Meal*weekend -> time -> variety | .0883* | .0251 | .0031 |
| | (.0227, .1727) | (-.0289, .0946) | (-.0590, .0646) |
| 3: Meal*weekend -> goals -> time -> variety | .0162* | .0128* | -.0048 |
| | (.0025, .0375) | (.0002, .0311) | (-.0181, .0066) |
| 4: Meal*weekend -> time -> goals -> variety | .0091 | .0026 | .0003 |
| | (-.0004, .0208) | (-.0055, .0124) | (-.0092, .0089) |

Note: Moderated mediation results using mixed effects regressions with random intercepts by individuals. Indirect effects estimated with 5000 clustered bootstrap samples. *95% confidence interval excludes zero.

### *3.3 Discussion*

The results of Study 2 support our hypotheses with direct measures of goals. Participants were less likely to pursue hedonic goals for breakfast than for lunch than for dinner. Furthermore, we have documented evidence of a declining effect of hedonic goals on variety seeking: consistent with our central prediction, we found that a change in hedonic goals was associated with a greater increase in variety seeking for breakfast than for lunch than for dinner.

The degree to which research participants pursued hedonic goals at meals predicted both how much time they spent eating and their level of variety seeking. The data do not support a model by which greater time spent eating drives the pursuit of hedonic goals and variety seeking. Together, the results support a goal-driven account of why people might both spend less time eating breakfast and exhibit a lower level of variety seeking for breakfast than for other meals (Khare & Inman, 2006).

In addition, the results provide further evidentiary support (in addition to the pretest reported before Study 1) for the assumption that hedonic goal pursuit at meals is greater over the weekend than on weekdays in Studies 1A and 1B.

Finally, consistent with our prediction, we find that influence of goals on variety seeking consumption will be smaller for dinner than for breakfast ($b_{\text{dinner}} < b_{\text{breakfast}}$). However, we also find that the influence of goals on variety seeking did not reach statistical significant for dinner ($b_{\text{dinner}} = 0$), which we did not expect. Considering study 1A in which our goal proxy significantly increased variety seeking for dinner, we believe that one reason behind study 2's results may be due to lower statistical power due to a smaller sample size ($N = 200$ in study 2 vs. $N = 1275$ in Study 1A).

## 4. Study 3: Manipulating Hedonic Goals using Experimental Design

In Study 3, we manipulated the pursuit of hedonic and utilitarian goals and measured their effects on what participants intended to eat for their next breakfast—whether they intended to repeat a combination of foods recently eaten for breakfast. The comparison of participants randomly assigned to a hedonic intervention, utilitarian intervention, and to no intervention (i.e., control condition) allowed us to test the effect of increasing hedonic goals on variety seeking and to examine whether people spontaneously pursue utilitarian goals at breakfast. Our theory predicts that, relative to the control group, participants in the hedonic goal intervention condition should be more likely to intend to consume a novel combination of foods for breakfast. If utilitarian goals are spontaneously pursued at breakfast, then participants randomly assigned to pursue a utilitarian goal for breakfast should be as likely to intend to repeat a recent meal as members of the control group.

### *4.1 Method*

One hundred and eighty-one Amazon Mechanical Turk workers residing in the United States (40% female, $M_{age}$ = 36.34, $SD$ = 10.06) were randomly assigned, on a Monday, to one of three groups: control ($n$ = 60), hedonic goal intervention ($n$ = 59), or utilitarian goal intervention ($n$ = 62). These goal manipulations were adapted from Botti and McGill (2010) and Whitley, et al. (2018).

In the control group, participants were instructed, “Your objective for tomorrow: we would like you to eat breakfast.” In the hedonic goal intervention group, participants were instructed, “Your objective for tomorrow: we would like you to maximize your enjoyment with a pleasurable breakfast.” In the utilitarian goal intervention group, participants were instructed,

"Your objective for tomorrow: we would like you to maximize your convenience with an efficient breakfast."

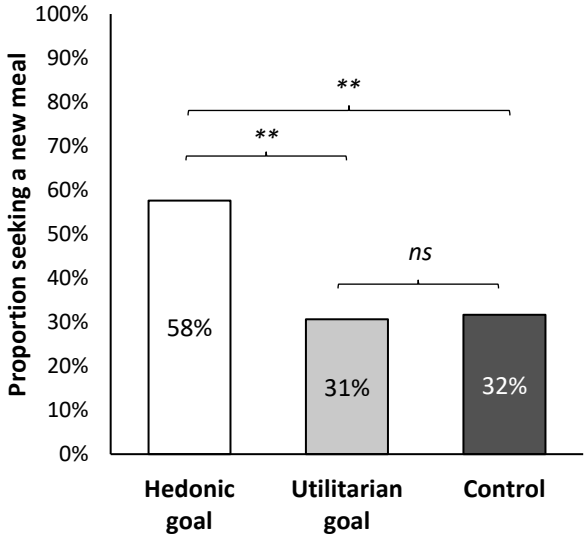
Next, participants identified the foods they intended to eat for breakfast the next day. To measure variety seeking, they indicated whether they had consumed that combination of foods at breakfast in the past week on a binary yes-or-no-choice measure. Participants rated the meal they planned to eat on its healthiness and tastiness and on their anticipated enjoyment. Next, they reported whether they planned to eat that breakfast in or outside the home, and in the presence or absence of other people. Participants also completed four measures of arousal in the morning ($\alpha$ = .91, Smith, Reilly, & Midkiff, 1989) on 5-point scales with questions such as, "Assuming normal circumstances, how easy do you find getting up in the morning?" (with endpoints such as 1 = *not at all easy* and 5 = *very easy*).

Finally, we included two manipulation checks. First, we asked participants how much time they planned to spend preparing and eating their breakfast the next day, indicated on an analog slider with endpoints 0 and 60 minutes. Second, we included four measures of utilitarian versus hedonic goals adapted from Whitley, et al. (2018) regarding the degree to which their goal for breakfast the next morning was related to enjoyment, pleasure, practicality, and convenience, on 7-point scales with endpoints 1 (*strongly disagree*) and 7 (*strongly agree*). We reverse coded the last two utilitarian items and averaged them with the two hedonic items into a single index ($\alpha$ = .67), with higher values indicating a more hedonic goal.

A manipulation check on hedonic goals revealed a significant main effect of condition ($F(2,177) = 19.69$, $p < .001$; see Supplementary Material 15). Hedonic goals were significantly greater in the hedonic goal intervention ($M = 4.53$, $SE = .12$) than the utilitarian goal intervention group ($M = 3.63$, $SE = .11$, $\beta = –.90$, $t = –5.69$, $p < .001$), and compared to the control group ($M = 3.71$, $SE = .11$, $\beta = -.83$, $t = -5.17$, $p < .001$). Suggesting that participants were already pursuing

utilitarian goals for breakfast, there was no difference in the hedonism of the goal pursued between the utilitarian goal intervention and the control group ($\beta$ = .08, $t$ = .48, $p$ = .63).

**Figure 3. Variety Seeking by Hedonic and Utilitarian Interventions**




### *4.2 Results*

As a test of our hypothesis on the effect of increasing hedonic goals on variety seeking, we conducted a logistic regression with variety seeking across days as a binary dependent variable (0 = I have consumed this meal in the past week; 1 = I never consumed this meal in the past week). The independent variables were a dummy for the control condition and a dummy for the utilitarian goal condition, with the hedonic goal condition as a reference category. There was a significant main effect ($\chi(2)$ = 11.56, $p$ = .003). Consistent with our prediction, planned contrasts showed that the hedonic goal intervention increased variety seeking at breakfast compared to the utilitarian goal ($\beta$ = –1.12, $z$ = –2.95, $p$ = .003) and control ($\beta$ = –1.08, $z$ = –2.81, $p$ = .005; Figure 3) groups. We found no differences between the utilitarian goal and the control ($\beta$ = .05, $z$ = .12, $p$ = .90) groups. These results hold when controlling for eating location, presence of others, and morning arousal (Supplementary Material 16).

### *4.3 Discussion*

Study 3 found that an experimental manipulation increasing hedonic goal activation for breakfast increased intended variety seeking for that meal. The results also provide novel evidentiary support for the default goal pursued by people at breakfast. The similarly low levels of variety seeking exhibited by control group members (32%) and participants instructed to pursue a utilitarian goal at breakfast (31%) suggest that the default is to pursue a utilitarian rather than a hedonic goal for breakfast. Of course, we cannot rule out that the results are partially driven by a demand effect such that any instructions (e.g., "maximize your enjoyment") may encourage participants to do something different. However, not all instructions influenced intentions to repeat meals: the utilitarian goal scenario ("maximize convenience," Study 3) and priming a goal to spend more time preparing and eating the meal (Supplementary Material 17) did not influence variety seeking compared to control conditions.

## 5. Discussion

Across countries with different gastronomic traditions and cultures, we found a circadian rhythm in variety seeking across days: people more often eat the same meal every day at breakfast than at lunch or dinner. Our findings identify a psychological driver of this diurnal variation in variety seeking in meals across days. Different goals pursued at breakfast, lunch, and dinner underlie the different levels of variety sought at breakfast, lunch, and dinner. The relationship between goals and variety seeking across days was found in diary data, event reconstruction methods, and experimental methods. People were more likely to engage in variety seeking when endogenous factors increased their pursuit of hedonic goals, such as when eating meals over the weekend rather than on weekdays (Studies 1–2), or at dinner rather than at

breakfast (Studies 1–2). Exogenous increases in the pursuit of hedonic goals affected a similar increase in variety seeking at breakfast in Study 3. Finally, we observed that a similar increase in hedonic goal activation enacts a larger increase in variety seeking across days at breakfast than at lunch than at dinner, suggesting a diminishing marginal effect of hedonic goal activation on variety seeking.

Our results are consistent with Gullo et al. (2019), in which consumers seek less variety in the morning due to a (diurnal) lower need for arousal. Thus, they are consistent with a circadian variation explanation. In a state of lower need for arousal, individuals are less likely to enact hedonic goals. Theoretically, physiological differences should be a distal explanation and hedonic goals a more proximal explanation. Compared to (physiological) arousal. however, hedonic goals are psychological and more malleable. Consumers often consciously choose which goals to pursue.

Our research disentangles the underlying role of time in modulating variety seeking in meals across days. Khare and Inman (2006) suggested that time scarcity plays a causal role in variety seeking across meals. We suggest a revised view, that greater time usage is one of many downstream consequences of increased hedonic goals. In other words, the term “time scarcity” implies a deterministic constraint. People experiencing time scarcity might be viewed as constructing the optimal meal for which they have time (e.g., “I ate a breakfast bar because it required no time to prepare and I could eat it on the train”). Our findings suggest that people have some flexibility in the time they allocate to a meal, depending on the goal associated with its consumption (e.g., Etkin, Evangelidis, & Aaker, 2015). An increase in the pursuit of a hedonic goal for a meal increases how much time is allocated to the meal, which in turn increases variety seeking for that meal (Study 2). We did not find that increasing time devoted to a meal without changing the salient consumption goal increases variety seeking (Supplementary Material 17).

Indeed, if people have little motivation to have a pleasurable breakfast and the goal pursued at breakfast is mostly utilitarian, spending additional time to prepare and eat a novel meal may be frustrating and feel counterproductive.

An obvious concern with this interpretation of the relationship between hedonic goals and variety seeking across days is the possibility that the declining influence of hedonic goals is simply due to a ceiling effect. In other words, there is already so much variety seeking at lunch and dinner that additional variation in those meals is impossible. We statistically tested for this alternative account of the relationship at dinner, where participants exhibited the greatest variety seeking, and found it to be implausible. In all studies comparing the influence of hedonic goals on variety seeking (Studies 1A, 1B, and 2), we found that variety seeking at dinner was statistically lower than the scale ceiling (all $Z$s $\geq 3.13$ all $p$s $\leq .002$). Thus, a ceiling effect is unlikely to explain the diminishing effect of hedonic goals on variety seeking from breakfast to lunch to dinner.

Variety seeking across days is likely to be affected by other factors present in the situation and within the consumer. We could control for two likely sources of influence: whether the meal was eaten in the presence or absence of others and in or outside the home. We included both factors as covariates in our analyses. Neither changed the significance of our central prediction (i.e., a *meal* × *goal* interaction on variety seeking). As eating with friends, or eating out, could potentially increase hedonic goals, we also examined whether the covariates systematically moderated the main prediction. They did not (see Supplementary Material 13). Similarly, while our results are robust to two different cultures (France and the United States), we invite future research to explore breakfast monotony in the context of Asian cultures, where breakfast consumption clearly differs from Western cultures (Howden, et al., 1993).

Last, an obvious concern associated with hedonic interventions is a potential negative impact on indulgent food choices. We believe that an increase in variety seeking at breakfast that is prompted by hedonic goals is unlikely to have deleterious health effects for most people. First, a growing body of work on food well-being (Block, et al., 2011) shows that while visceral hedonic goals can lead to indulgent choices, epicurean hedonic goals can be an ally of heathy eating (Cornil & Chandon, 2016a, 2016b). Similarly, research has shown that hedonic enhancements (e.g., appetizing product names) can have a positive impact on consumer attitudes (Cadario & Chandon, 2019) and facilitate the choice and consumption of healthy foods (Cadario & Chandon, 2020). Second, the relationship between variety seeking and health outcomes is complicated. On the one hand, repeating the same meals (i.e., reducing variety seeking) leads research participants to eat less food due to sensory-specific satiety (Meiselman, deGraaf, & Lesher, 2000). On the other hand, increasing variety seeking can also make a diet less boring and thus help people with a weight loss goal to sustain healthy dietary choices (Haws, et al., 2017). In a longitudinal study, Haws, et al. (2017) found that eating a greater variety of foods led to weight loss. This relationship appears to be strongest for variety seeking at breakfast and is particularly tied to the variety of vegetables a person consumes. To examine whether we observed a similar pattern in our samples, we reanalyzed data from Study 1A and found that (a) the indirect effect of the hedonic goal proxy on fruit and vegetable consumption through variety seeking was positive and significant, and (b) that this indirect effect was stronger for breakfast than for lunch and for dinner (see Supplementary Material 18 for details). This tentative evidence suggests that increasing variety seeking can lead to positive health consequences and provides avenues for future research.

We believe that the patter of variety seeking across days might occur in other domains such as music (e.g., I am listening to the same songs in the morning and different songs in the

evening) or social relationships (e.g., I would rather see a variety of friends in the evening but only family in the morning). We encourage future research to further examine this relationship between goals and variety seeking across domains and between multiple domains.

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**Supplementary Materials to**

# Why do People Eat the Same Breakfast Every Day?
# Goals and Circadian Rhythms of Variety Seeking in Meals

## Supplementary Material 1. Pilot Study A in the Online Retailing Industry

In this pilot Study, we scraped data from Amazon.com using webscraper.io. While Amazon has a breakfast category, there is no lunch or dinner category. Therefore, we performed three searches for "breakfast", "lunch" and "dinner" within the "grocery and gourmet food" category. For each search, we gathered all products from pages 1 to 45, yielding a total sample of 3,095 products. Some products appeared several times within the same meal, we removed these duplicate observations and the final sample consisted of 2,982 observations.

To verify that we identified relevant products, we also scraped products on the "breakfast foods" category from pages 1 to 45. The result of an alternative comparison including this sample for the breakfast category (i.e., breakfast category, lunch search, dinner search) led to similar results, presented in Table W1B.

**Figure W1A. Sample product on Amazon.com**


*Methods*. As shown in Figure W1A, we recorded the products name descriptions (e.g., "Pure Protein Bars, High Protein, Nutritious Snacks to Support Energy, Low Sugar, Gluten Free, Maple Caramel, 1.76oz, 6 Pack"), price (e.g., "$10.69"), number of ratings (e.g., "681 ratings"), and average ratings (e.g., "4.3 out of 5").

We first computed the total number of words in product names. To compute the number of hedonic words, we used word lexicons from Jurafsky, Chahuneau, Routledge, and Smith (2016), which including 13 positive food sentiment (e.g. delicious, savory, tasty, etc.) and 164 sensory adjectives (e.g. fresh, crispy, zesty). Out of the 164 sensory adjectives, Cornil and Chandon (2018) selected a list of 77 "epicurean" sensory adjectives related to pleasurable or hedonic goals. We included these two categories (i.e., positive and epicurean) into a 90 word hedonic lexicon.

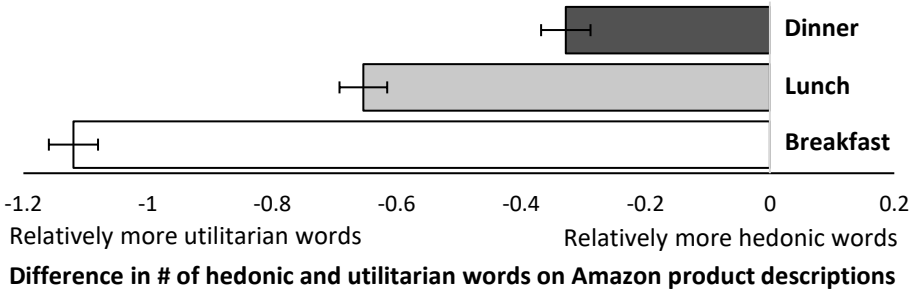
Next, we developed a lexicon of 58 utilitarian words related to convenience, food as fuel and food as health, party adapted from André, Chandon, and Haws (2019). The word lexicons are listed in Table W1A. Our dependent variable was the difference between the number of hedonic words and the number of utilitarian words per product name description.

**Table W1A. Utilitarian and hedonic word lexicons**

| Variable | Word lexicon |
|---|---|
| **Hedonic** | *Positive food sentiment*: appetizing, delectable, delicious, flavorful, gourmet, luscious, mouthwatering, savory, scrumptious, tastiest, tasty, toothsome, yummy.<br>*Hedonic sensory descriptors:* Airy, aromatic, bittersweet, bloomy, bold, braised, bright, briny, brisk, chargrilled, citrusy, coarse, colorful, complex, crumbly, dark, delicate, dense, earthy, explosive, fiery, finely, flaky, flame-broiled, flowery, fluffy, fragrant, fresh, freshest, freshly, frothy, golden, herbal, lemony, lighter, luscious, lush, luxurious, malty, meltingly, moist, nutty, perfumed, piquant, plump, puffy, rich, richer, richest, richly, ripe, roasted, robust, saucy, sautéed, seared, sharp, sharply, silken, silky, simmered, smoky, smooth, smoother, spicy, spongy, strong, succulent, sultry, supple, tender, tenderly, toasty, velvety, vibrant, vinegary, zesty. |
| **Utilitarian** | *Convenience*: busy, convenience, convenient, easy, effective, efficiency, efficient, fast, functional, handy, instant, on-the-go, practical, quick, ready, rush, useful.<br>*Food as fuel*: antioxidant, calcium, energetic, energized, energy, fiber, filling, fuel, minerals, nutrient, nutritious, omega, probiotics, protein, vitamins, workout.<br>*Food as health (no, low, without)*: additives, artificial, calories, carb, carbohydrates, chemicals, cholesterol, dairy, diet, fat, fructose, gluten, gmo, healthy, hormones, lactose, nutrition, organic, pesticide, preservatives, salt, sugar, sweeteners, unsweetened, vegan. |

Note: Hedonic words list taken from Jurafsky et al. (2016) and Cornil and Chandon (2018). Utilitarian lexicon developed by the authors, partly adapted from André, et al. (2019).

**Figure W1B. Relative use of hedonic and utilitarian words by meal**




*Results*. The results are detailed in Figure W1B and Table W1B. We estimated a linear regression with difference of hedonic and utilitarian words as the dependent variable, lunch and dinner dummies, controlling for the number of words, price, the number of ratings and the average ratings. As expected, the relative use of hedonic vs. utilitarian words was lower for breakfast ($M$ = -1.12, $SE$ = .04) than for lunch ($M$ = -.65, $SE$ = .04, $\Delta$ = .47, $t$ = 8.46, $p$ < .001) and dinner ($M$ = -.33, $SE$ = .04, $\Delta$ = .79, $t$ = 13.96, $p$ < .001). The difference between lunch and dinner was also significant ($\Delta$ = .32, $t$ = 5.88, $p$ < .001). The results hold when excluding covariates, removing the products that appear in several categories, and with the alternative sample (with products from the breakfast category instead of the "breakfast" search). Last, we examine whether this result is due to a decrease in hedonic descriptions, an increase in utilitarian descriptions, or both. We find evidence for similar variations in the number of utilitarian words from breakfast to lunch to dinner. However, there were no significant variations in the number of hedonic words between the three meals.

**Table W1B. Results from the regression analyses**

| | DV: difference = hedonic - utilitarian | DV: difference = hedonic - utilitarian | DV: utilitarian | DV: hedonic | DV: difference Without between-meal duplicates | DV: difference Alternative sample |
|---|---|---|---|---|---|---|
| Meal | | | | | | |
| Lunch (vs. breakfast) | .58*** | .47*** | -.45*** | .02 | .46*** | .71*** |
| Diner (vs. breakfast) | 1.02*** | .79*** | -.80*** | -.01 | .80*** | .93*** |
| Price | | .00 | .00 | .00 | .00 | .01 |
| Words | | -.08*** | .10*** | .02*** | -.08*** | -.11*** |
| Number of ratings | | -.00*** | .00*** | .00 | -.00*** | .00*** |
| Average rating | | -.01 | .01 | .00 | .00 | .06 |
| Intercept | -1.20*** | -1.12*** | 1.30*** | .18*** | -1.12*** | -1.31*** |
| Observations | 2,982 | 2,312 | 2,312 | 2,312 | 2,052 | 2,291 |
| Adjusted R2 | .11 | .28 | .39 | .08 | .28 | .40 |

Note: Covariates are mean centered. Difference between lunch and dinner in models 1 to 6 are M1: β =.43, t=8.51, p<.001 ; M2: β =.32, t=5.88, p<.001 ; M3: β =-.34, t=6.85, p<.001 ; M4: β =-.02, t=.98, p=.32 ; M5: β =.34, t=5.76, p<.001 ; M6: β =.22, t=3.79, p<.001.

## Supplementary Material 2. Pilot Study A: descriptive statistics

| Variable name | Variable description | Observations | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|---|
| Words | Number of words | 2,982 | 13.62 | 6.45 | 2 | 38 |
| Hedonic | Number of hedonic words | 2,982 | .19 | .44 | 0 | 3 |
| Utilitarian | Number of utilitarian words | 2,982 | .84 | 1.20 | 0 | 10 |
| Difference | Hedonic - Utilitarian | 2,982 | -.65 | 1.22 | -9 | 3 |
| Price | Price in dollars | 2,535 | 15.66 | 19.71 | .11 | 229.95 |
| Number of ratings | Number of ratings | 2,711 | 271.11 | 889.65 | 1 | 20811 |
| Average rating | Average rating from 1 to 5 | 2,711 | 4.10 | .62 | 1 | 5 |

## Supplementary Material 3. Pilot Study B in the Restaurant Industry

In this pilot study, we used publicly available menu descriptions data from Jurafsky, et al. (2016), scrapped data on Allmenus.com and Yelp.com for 6511 restaurants and 591,980 menu items. The restaurant-level variables include restaurant city (7 large American cities), price category ($ to $$$$), and cuisine category (33 categories reduced to 11 categories for simplification). The item-level variables include price and number of words in the descriptions.

**SM3 Figure A: Item-level covariates**

| Variable name | Variable description | Observations | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|---|
| Words | Number of words | 591,980 | 8.071 | 6.632 | 0 | 126 |
| Hedonic | Number of hedonic words | 591,980 | 0.176 | 0.444 | 0 | 6 |
| Utilitarian | Number of utilitarian words | 591,980 | 0.086 | 0.296 | 0 | 4 |
| Price | Price in dollars | 586,986 | 8.999 | 6.833 | 0.04 | 525.25 |

**SM3 Figure B: Restaurant-level covariates**

| Variable | Observations | Percentage |
|---|---|---|
| *Cuisine category* | | |
| Chinese | 126,351 | 21.34% |
| European Other | 87,684 | 14.81% |
| Steakhouse | 57,326 | 9.68% |
| Italian | 33,956 | 5.74% |
| American (traditional) | 33,611 | 5.68% |
| Mediterranean | 28,647 | 4.84% |
| Diners | 22,306 | 3.77% |
| Thai | 21,557 | 3.64% |
| American | 21,363 | 3.61% |
| Pizza | 16,102 | 2.72% |
| Other | 143,077 | 24.17% |
| *City* | | |
| Boston | 56,302 | 9.51% |
| Chicago | 43,446 | 7.34% |
| Los Angeles | 13,979 | 2.36% |
| New York | 280,560 | 47.39% |
| Philadelphia | 66,827 | 11.29% |
| San Francisco | 89,421 | 15.11% |
| Washington, D.C. | 41,445 | 7.00% |
| *Price category* | | |
| $ | 251,440 | 42.47% |
| $$ | 290,923 | 49.14% |
| $$$ | 42,287 | 7.14% |
| $$$$ | 7,330 | 1.24% |

*Methods*. We used the same lexicons detailed in Supplementary Material 1 and computed the number of utilitarian and hedonic words per menu item. Next, we created a breakfast lexicon (e.g. Bacon egg, benedict, breakfast, cereal, corn flakes, croissant, Danish, donut, egg bacon, egg Florentine, egg sausage, French toast, fried egg, frosted flakes, granola, hash brown, muesli, muffin, oatmeal, omelet, pancake, poached egg, sausage egg, scone, scrambled egg, sunny side, two egg, waffle). We computed a dummy variable to code for breakfast yielding 15,273 observations (2.6% of the sample).

**SM3 Table A. Results from the mixed-effects regression analyses**

| | ***DV: hedonic - utilitarian*** | | ***DV: hedonic*** | | ***DV: utilitarian*** | |
|---|---|---|---|---|---|---|
| | ***Coef.*** | ***SE*** | ***Coef.*** | ***SE*** | ***Coef.*** | ***SE*** |
| Intercept | .10*** | .002 | .19*** | .004 | .09*** | .003 |
| Breakfast | -.05*** | .002 | -.05*** | .003 | -.00 | .002 |
| *Item-level covariates* | | | | | | |
| Price | .00*** | .000 | .00*** | .000 | -.00** | .000 |
| Words | .01*** | .000 | .03*** | .000 | .01*** | .000 |
| *Restaurant-level covariates* | | | | | | |
| Price category (1 reference category and 3 contrasts) | | | | | | |
| Cities (1 reference category and 6 contrasts) | | | | | | |
| Cuisine category (1 reference and 10 contrasts) | | | | | | |
| Restaurants | 6510 | | 6510 | | 6510 | |
| Observations | 586,986 | | 586,986 | | 586,96 | |

Notes: * p<.05, ** p<.01, *** p<.001. Item-level covariates are men centered and restaurant-level categorical covariate are anova-coded (3/4, -¼, -¼, -¼). Coefficients from restaurant-level covariates omitted for readability.

*Results*. We use multilevel mixed-effects linear regressions with items nested in restaurants. As shown in Appendix W4, we estimated a regression with the difference in number of hedonic words and number of utilitarian words as dependent variable and the breakfast dummy as independent variable, including restaurant-level (city, price category, cuisine category) and item-level covariates (price and number of words). As hypothesized, the effect of breakfast was negative and significant ($\beta$ = -.05, $z$ = -21.28, $p < .001$). Compared to lunch and dinner foods, breakfast foods are less likely to be described with hedonic (vs. utilitarian) descriptions.

Next, we examine whether this result is due to a decrease in hedonic descriptions, an increase in utilitarian descriptions, or both. We find evidence for the first explanation. The effect of breakfast (vs. other meal) was significant with the number of hedonic words as dependent variable ($\beta$ = -.05, $z$ = -16.18, $p$ < .001) but not significant with the number of utilitarian words as a dependent variable ($\beta$ = -.00, $z$ = -1.32, $p$ = .19).

In both pilot studies A and B, the relative use of hedonic (vs. utilitarian) words was lower for breakfast than for other meals. However, the effect was driven by an increase in utilitarian words in the online retailing industry (pilot study A) and by an increase in hedonic words in the restaurant industry. The fact that restaurants use more hedonic descriptions than online retailers makes intuitive sense given the differences in consumption settings. Still, even in a more hedonic environment such as restaurants, breakfast foods are less likely to be described with hedonic words.

## Supplementary Material 4. Pretest in Study 1A-B

*Participants and Procedure.* On a Monday morning, we recruited 80 Amazon Mechanical Turk Workers (42% female, $M_{age}$ = 35.23, *SD* = 10.68) to recall the food they ate in the previous week: the last five weekdays and two days over the weekend. They then separately rated the extent to which their goals for weekday and weekend meals were hedonic or utilitarian (i.e., two sets of ratings in total). Each time period was rated on four scale items measuring utilitarian versus hedonic goals adapted from Whitley, et al. (2018). Participants were asked "in the weekend (Saturday and Sunday), to what extent the objective of your food consumption was related to" the enjoyment, pleasure, practicality, and convenience of meals (1 = Strongly Disagree and 7 = Strongly Agree). We also measured the four items for meals "in the weekdays (Monday to Friday)". We reverse-coded the last two utilitarian items and averaged them with the two hedonic items into a single index ($\alpha$ = .74), with higher values indicating a more hedonic than utilitarian goal. We also collected three control variables for each type of meal on weekdays and over the weekend: time spent eating (i.e., number of minutes), the presence of others ("Did you eat this meal in the presence of others: yes/no") and consumption location ("Did you eat this meal at home: yes/no"). We then averaged these three control variables in within weekdays and within the weekend.

*Results*. Validating our assumptions, results from a mixed-effect regression showed that hedonic goals were higher for meals eaten on the weekend than on weekdays (m = 3.59 vs. m = 4.11, $\beta$ = .51, $z$ = 4.72, $p$ < .001); this result held when including the three control variables into the regression ($\beta$ = .48, $z$ = 4.32, $p$ < .001).

**Supplementary Material 5. Study 1A: Exclusions and Alternative Specifications**

| | **Estimates reported in the main text** | **Estimates with 44 categories from Study 1B** | **Estimates including participants under 18** | **Estimates including snacks** | **Estimates across 14 day window** | **DV: aggregated variety** | **DV: entropy** |
|---|---|---|---|---|---|---|---|
| Intercept | .55 (.01)*** | .52 (.01)*** | .55 (.01)*** | .55 (.01)*** | .72 (.01)*** | .50 (.01)*** | 1.35 (.02)*** |
| Meal (reference = breakfast) | | | | | | | |
| Lunch | .10 (.01)*** | .12 (.01)*** | .11 (.01)*** | .10 (.01)*** | .07 (.01)*** | .18 (.01)*** | .46 (.02)*** |
| Dinner | .17 (.01)*** | .19 (.01)*** | .17 (.01)*** | .17 (.01)*** | .12 (.01)*** | .20 (.01)*** | .81 (.02)*** |
| Morning snack | | | | -.34 (.01)*** | | | |
| Afternoon snack | | | | -.27 (.01)*** | | | |
| Evening snack | | | | -.19 (.01)*** | | | |
| Individuals | 1,275 | 1,275 | 1,671 | 1,275 | 1,310 | 1,275 | 1,275 |
| Meals | 3,768 | 3,768 | 4,954 | 5,479 | 3,987 | | |
| Observations | 18,556 | 18,556 | 24,815 | 22,8599 | 37,295 | 3,769 | 3,769 |

* p<.05, ** p<.01, *** p<.001

Aggregated measures of variety and entropy are presented in Supplementary Material 8

**Supplementary Material 6. Food Categories in Study 1A**

| ID | FOOD DESCRIPTION | ID | FOOD DESCRIPTION |
|---|---|---|---|
| 100 | GRAIN: OTHER | 192 | GRAIN: MIXTURES, PASTA |
| 111 | BREAD: BAGELS | 193 | GRAIN: MIXTURES, PIZZA |
| 112 | BREAD: CROISSANT | 194 | GRAIN: MIXTURES, SOUP |
| 113 | BREAD: CROUTONS | 211 | VEGETABLE: WHITE POTATO, SOUP |
| 114 | BREAD: ENGLISH MUFFINS | 212 | VEGETABLE: WHITE POTATO, BAKED |
| 115 | BREAD: ROLLS, WHEAT | 213 | VEGETABLE: WHITE POTATO, MASHED |
| 116 | BREAD: ROLLS, WHITE | 214 | VEGETABLE: WHITE POTATO, OTHER |
| 117 | BREAD: STUFFING | 215 | VEGETABLE: WHITE POTATO, SALAD |
| 118 | BREAD: WHEAT | 221 | VEGETABLE: WHITE POTATO, CHIPS |
| 119 | BREAD: WHITE | 222 | VEGETABLE: WHITE POTATO, FRIED |
| 120 | CEREAL: HOT | 230 | VEGETABLE: DARK GREEN |
| 130 | CEREAL: RTE | 241 | VEGETABLE: DEEP YELLOW |
| 141 | GRAIN: RICE, PLAIN | 242 | VEGETABLE: DEEP YELLOW, SWT POT |
| 142 | GRAIN: RICE W/SAUCE | 251 | VEGETABLE: TOMATOES |
| 151 | GRAIN: PASTA, PLAIN | 252 | VEGETABLE: TOMATO SAUCES |
| 152 | GRAIN: PASTA | 253 | VEGETABLE: TOMATO MIXTURES, SOUP |
| 160 | QUICK BREADS | 261 | VEGETABLE: LETTUCE/SALAD |
| 161 | QUICK BREAD: PANCAKES | 271 | VEGETABLE: OTHER |
| 162 | QUICK BREAD: WAFFLES | 281 | VEGETABLE: JUICE |
| 163 | QUICK BREAD: FRENCH TOAST | 282 | VEGETABLE: PICKLES/RELISH/OLIVES |
| 164 | QUICK BREAD: BISCUIT | 283 | VEGETABLE: CONDIMENTS |
| 165 | QUICK BREAD: CORNBREAD | 291 | VEGETABLE: MIXTURES |
| 166 | QUICK BREAD: MUFFINS | 292 | VEGETABLE: MIXTURES, SOUP |
| 167 | QUICK BREAD: TORTILLAS | 311 | FRUIT: CITRUS |
| 170 | CAKE | 321 | FRUIT: CITRUS JUICE |
| 171 | PIE, FRUIT | 322 | FRUIT: ORANGE JUICE |
| 172 | PIE, CREAM | 331 | FRUIT: DRIED |
| 173 | PIE, OTHER | 351 | FRUIT: APPLES |
| 174 | CAKE/PASTRY: GRANOLA BAR | 361 | FRUIT: BANANA |
| 175 | CAKE/PASTRY: SNACK BARS | 371 | FRUIT: MELONS/BERRIES |
| 176 | CAKE/PASTRY: SWEET ROLL | 381 | FRUIT: NONCITRUS JUICE |
| 177 | CAKE/PASTRY: SWT CRACKERS | 391 | FRUIT: MIXTURES |
| 178 | PASTRY/TURNOVER/DUMPLING | 392 | FRUIT: OTHER |
| 179 | PASTRY: BREAKFAST TART | 402 | MILK PRODUCTS: DIPS |
| 181 | CRACKERS | 404 | MILK PRODUCTS: OTHER |
| 182 | CRACKER/SNACK: PRETZELS | 405 | MILK PRODUCTS: SOUR CREAM |
| 183 | CRACKER/SNACK: POPCORN | 411 | MILK: FLAVORED |
| 184 | CRACKER/SNACK: CORN CHIP | 412 | MILK PRODUCTS: MEAL REPLACEMENT |
| 185 | CRACKER/SNACK: OTHER | 431 | MILK: WHOLE |
| 190 | GRAIN: MIXTURES | 441 | MILK: LOWFAT |
| 191 | GRAIN: MIXTURE, SALADS | 451 | MILK: NONFAT |

**Supplementary Material 6. Food Categories in Study 1A (continued)**

| ID | FOOD DESCRIPTION | ID | FOOD DESCRIPTION |
|---|---|---|---|
| 461 | YOGURT: PLAIN | 612 | EGGS: SALAD |
| 462 | YOGURT: FLAVORED | 613 | EGGS: SANDWICH |
| 463 | YOGURT: FRUIT | 614 | EGGS: SUBSTITUTE |
| 471 | MILK DESSERTS: FROZEN | 621 | LEGUMES: BEANS |
| 472 | MILK DESSERTS: FRZ YOGURT | 622 | LEGUMES: SOUP |
| 473 | MILK DESSERTS: ICE CREAM | 623 | LEGUMES: PEANUT BUTTER |
| 474 | MILK DESSERTS: PUDDING | 624 | LEGUMES: PEANUT BUTTER SANDWICH |
| 481 | CHEESE | 625 | LEGUMES: MEAT SUBSTITUTES |
| 482 | CHEESE: AMERICAN | 626 | LEGUMES: SOY MILK |
| 483 | CHEESE: COTTAGE | 627 | LEGUMES: OTHER |
| 484 | CHEESE: CREAM | 629 | LEGUMES: MIXTURES |
| 486 | CHEESE: OTHER | 631 | NUTS |
| 487 | CHEESE: SANDWICH | 632 | SEEDS |
| 488 | CHEESE: SPREADS | 711 | SHORTENING/OIL |
| 511 | BEEF: GROUND | 712 | FATS/OILS:  ND CREAM SUB |
| 512 | BEEF: OTHER | 714 | FATS/OILS: OTHER |
| 513 | BEEF: STEAK | 722 | TABLE FATS: MARGARINE |
| 521 | PORK: CHOPS | 732 | FATS/OILS: MAYO, REDUCED FAT |
| 522 | PORK: HAM | 733 | FATS/OILS: SALAD DRESSING |
| 523 | PORK: BACON | 734 | FATS/OILS: SLD DRSSING, LOW FAT |
| 524 | PORK: OTHER | 821 | CANDY, CHOCOLATE |
| 531 | MEAT: LAMB | 822 | CANDY, NON CHOCOLATE |
| 532 | MEAT: VEAL | 831 | SWEETS: BAKING |
| 533 | MEAT: GAME | 832 | SWEETS: CHEWING GUM |
| 541 | MEAT: ORGAN MEATS | 834 | SWEETS: FROZEN DESSERTS |
| 551 | MEAT: PROCESSED, HOT DOGS | 835 | SWEETS: FRUIT SNACKS |
| 552 | MEAT: PROCESSED, LUNCHEON | 836 | SWEETS: GELATIN |
| 553 | MEAT: PROCESSED, SAUSAGE | 837 | SWEETS: GELATIN, LOW CAL |
| 561 | TURKEY | 838 | SWEETS: HONEY |
| 562 | POULTRY: OTHER | 839 | SWEETS: JELLY/JAM |
| 571 | CHICKEN | 911 | BEVERAGE ALCOHOLIC: COCKTAILS |
| 581 | FISH | 912 | BEVERAGE ALCOHOLIC: LIQUOR |
| 582 | SHELLFISH | 921 | BEVERAGE ALCOHOLIC: WINE |
| 591 | MEAT: MIXTURES | 931 | BEVERAGE ALCOHOLIC: BEER |
| 593 | MEAT: MIXTURES, SOUP | 941 | BEVERAGE CSD: REGULAR |
| 594 | MEAT: MIXTURES, FISH | 942 | BEVERAGE CSD: LOW CAL |
| 595 | MEAT: MIXTURES, POULTRY | 943 | BEVERAGE: SPORTS DRINK |
| 596 | MEAT: GRAVY | 951 | BEVERAGE: COFFEE |
| 597 | MEAT: SANDWICH | 961 | BEVERAGE: TEA |
| 598 | MEAT: SALAD | 971 | BEVERAGE: FRUIT DRINKS |
| 610 | EGGS | 972 | BEVERAGE: FRUIT DRINK, LOW CAL |
| 611 | EGGS: MIXTURES | | |

**Supplementary Material 7. Disaggregated Measure of Variety Seeking Across Days in Studies 1A & 1B:**

| Id | Meal | Day | Consumption data: food combinations | # of weekly repetitions per meal | Variety seeking across days |
|---|---|---|---|---|---|
| Mary | Breakfast | Monday | Coffee & bread & jam | 5 | 1-(5/7) |
| Mary | Breakfast | Tuesday | Coffee & bread & jam | 5 | 1-(5/7) |
| Mary | Breakfast | Wednesday | Coffee & bread & jam | 5 | 1-(5/7) |
| Mary | Breakfast | Thursday | Coffee & bread & jam | 5 | 1-(5/7) |
| Mary | Breakfast | Friday | Coffee & bread & jam | 5 | 1-(5/7) |
| Mary | Breakfast | Saturday | Coffee & bread & jam & bacon | 1 | 1-(1/7) |
| Mary | Breakfast | Sunday | Cereals & milk | 1 | 1-(1/7) |
| Mary | Lunch | Monday | Ham & cheese | 1 | 1-(1/6) |
| Mary | Lunch | Wednesday | Ham, yogurt & toast | 3 | 1-(3/6) |
| Mary | Lunch | Thursday | Ham, yogurt & toast | 3 | 1-(3/6) |
| Mary | Lunch | Friday | Ham, yogurt & toast | 3 | 1-(3/6) |
| Mary | Lunch | Saturday | Eggs & bacon | 1 | 1-(1/6) |
| Mary | Lunch | Sunday | Croissant | 1 | 1-(1/6) |

Note: variety seeking across days equals to 1 – (# weekly repetition / # meals)

## Supplementary Material 8. Aggregated Measures of Variety Seeking Across Days in Studies 1A-B

The hierarchical structure of our data is the following: days *d* are nested in meal occasions *m* (breakfast, lunch, dinner) which are in turn nested in individual panelists *i*. We have data on the different food categories $\boldsymbol{j} \in [1, \ldots, J]$ consumed for each *imd* groups.

Gullo, et al. (2019) measure variety as the "number of unique UPCs purchased in a category, relative to the number of total items purchased in that category". Given the different longitudinal nature of our data, we use a similar yet slightly adapted measure. The denominator is the number of total items consumed over the week for a given meal. The numerator is equal to the number of unique (or different) items consumed over the week for a given meal:

$$Variety_{im} = \frac{number\ of\ unique\ items\ consumed\ over\ the\ week}{number\ of\ all\ items\ consumed\ over\ the\ week}$$

Let us take the example of Mary's breakfast consumption from Appendix W6. Mary consumed 6 different products (coffee, bread, jam, bacon, cereals and milk) and a total of 21 items for breakfast over the week.

$$\text{Variety}_{\text{Mary,Breakfast}} = \frac{6}{21} = .29$$

Last, we also computed an additional measure of entropy adapted from Van Herpen and Pieters (2002) and defined as follows: $Entropy_{im} = -\sum_j^J p_j \ln(p_j)$, where $p_j$ represents the proportion of food item *j* over all items consumed over the week for meal *m* of individual *i* (i.e., $n_j/N$). For example, the proportion of bread in Mary's breakfast is $p_{bread} = 6/21$.

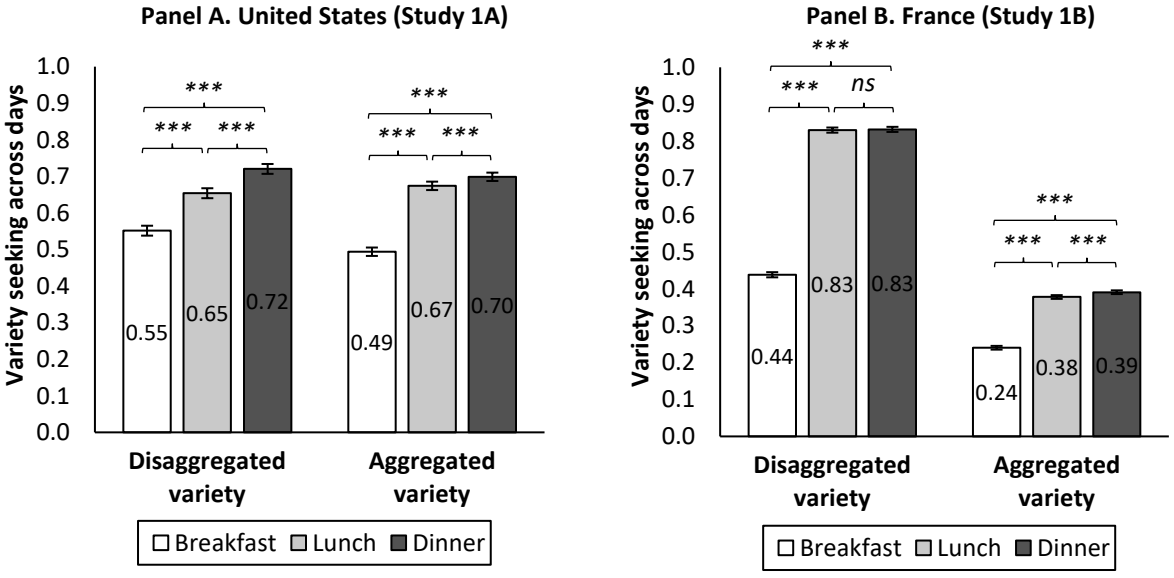
## Supplementary Material 9. Results from the Multilevel Mixed-Effect Regressions in Study 1A: USA

| Model number | Model 1<br>Coef (se) | Model 2<br>Coef (se) | Model 3<br>Coef (se) |
|---|---|---|---|
| Hypothesis | Breakfast monotony | Main effect of weekend | Main prediction |
| Intercept | .55 (.01)*** | .55 (.01)*** | .55 (.01)*** |
| Meal occasions | | | |
| LUNCH (vs. breakfast) | .10 (.01)*** | .10 (.01)*** | .10 (.01)*** |
| DINNER (vs. breakfast) | .17 (.01)*** | .17 (.01)*** | .17 (.01)*** |
| WEEKEND (vs. week) | | .02 (.00)*** | .05 (.00)*** |
| LUNCH×WEEKEND | | | -.03 (.00)*** |
| DINNER×WEEKEND | | | -.04 (.00) *** |
| Individuals | 1,275 | 1,275 | 1,275 |
| Meals | 3,768 | 3,768 | 3,768 |
| Observations | 18,556 | 18,556 | 18,556 |

* p<.05, ** p<.01, *** p<.001

Note: DV is the disaggregated variety seeking measure. The bolded coefficient in M3 represents the simple effect of weekend (vs. week days) for breakfast (β=.05, z=16.07, p<.001). The simple effect of weekend for lunch is smaller but still significant (β=.02, z=5.58, p<.001) while it is not significant for dinner (β=.00, z=1.21, p=.23).

**Breakfast Monotony Robust Across Cultures and Measures (Studies 1A & 1B)**




Note: estimates from multilevel mixed-effects regressions, bars represent the 95% confidence interval. Aggregate measure of variety is presented in Supplementary Material 8.

## Supplementary Material 10. Covariates in Study 1B (France)

| Name | Description | Descriptive statistics | | |
|---|---|---|---|---|
| | | Meal | *M** | *sd* |
| TIME | Time per meal occasion | Breakfast | 21.20 | 9.96 |
| | | Lunch | 40.49 | 17.59 |
| | | Dinner | 42.28 | 21.84 |
| OTHERS | Presence of others (vs. consumption alone) | Breakfast | .43 | .39 |
| | | Lunch | .73 | .32 |
| | | Dinner | .80 | .32 |
| HOME | Eating at home (vs. outside) | Breakfast | .90 | .23 |
| | | Lunch | .68 | .32 |
| | | Dinner | .83 | .25 |

*Predictors averaged across the week for the three separate meals.

## Supplementary Material 11. Detailed results from Study 1B in France

**Panel A: Direct effects and central prediction**

| **Model number** | **Model 1**<br>**Coef (se)** | **Model 2**<br>**Coef (se)** | **Model 3**<br>**Coef (se)** |
|---|---|---|---|
| **Hypothesis** | **Direct effect of meals with/without covariates** | | **Central prediction** |
| Intercept | .44 (.00)*** | .43 (.00)*** | .43 (.00)*** |
| Meal occasions | | | |
| LUNCH (vs. breakfast) | .39 (.00)*** | .39 (.00)*** | .40 (.00)*** |
| DINNER (vs. breakfast) | .39 (.00)*** | .39 (.00)*** | .40 (.00)*** |
| Natural variations in hedonic goals | | | |
| WEEKEND (vs. weekday) | | .01 (.00)*** | .04 (.00)*** |
| Covariates | | | |
| TIME (time per meal) | | .00 (.00) | .00 (.00)** |
| OTHERS (with others vs. alone) | | .02 (.00)*** | .02 (.00)*** |
| HOME (at home vs. outside) | | -.00 (.00) | -.00 (.00) |
| Interactions | | | |
| LUNCH×WEEKEND | | | -.04 (.00)*** |
| DINNER×WEEKEND | | | -.04 (.00)*** |
| Individuals | 2,624 | 2,607 | 2,607 |
| Meals | 7,817 | 7,731 | 7,731 |
| Observations | 51,594 | 49,206 | 49,206 |

* p<.05, ** p<.01, *** p<.001

Note: DV is the disaggregated variety measure. The bolded coefficient in M3 represents the simple effect of weekend (vs. week days) for breakfast ($\beta$=.04, z=24.19, p<.001). The change in sample size for M1 to other models is due to missing values in time spent at meal.

## Supplementary Material 11. Detailed results from Study 1B in France (continued)

**Panel B: Detailed analyses including control variables**

| **Model number** | **Model 4 COV=time Coef (se)** | **Model 5 COV=time Coef (se)** | **Model 6 COV=others Coef (se)** | **Model 7 COV=others Coef (se)** | **Model 8 COV=home Coef (se)** | **Model 9 COV=home Coef (se)** |
|---|---|---|---|---|---|---|
| Intercept | .40 (.00)*** | .40 (.00)*** | .41 (.00)*** | .42 (.00)*** | .45 (.01)*** | .45 (.01)*** |
| Meal occasions | | | | | | |
| LUNCH (vs. breakfast) | .42 (.01)*** | .42 (.01)*** | .41 (.01)*** | .41 (.01)*** | .36 (.01)*** | .36 (.01)*** |
| DINNER (vs. breakfast) | .42 (.01)*** | .42 (.01)*** | .41 (.01)*** | .41 (.01)*** | .36 (.01)*** | .36 (.01)*** |
| Natural variations in hedonic goals | | | | | | |
| WEEKEND (vs. weekday) | **.04 (.00)*** ** | .05 (.00)*** | **.04 (.00)*** ** | .03 (.00)*** | **.04 (.00)*** ** | .05 (.01)*** |
| Covariates | | | | | | |
| TIME (time per meal) | .00 (.00)*** | .00 (.00)*** | .00 (.00)*** | .00 (.00)*** | .00 (.00)*** | .00 (.00)*** |
| OTHERS (with others vs. alone) | .01 (.00)*** | .01 (.00)*** | .03 (.00)*** | .02 (.00)*** | .01 (.00)*** | .01 (.00)*** |
| HOME (at home vs. outside) | -.00 (.00) | -.00 (.00) | -.00 (.00) | -.00 (.00) | -.04 (.00)*** | -.04 (.00)*** |
| Interactions with hedonic goals | | | | | | |
| LUNCH×WEEKEND | -.04 (.00)*** | -.04 (.00)*** | -.04 (.00)*** | -.03 (.00)*** | -.04 (.01)*** | -.04 (.01)*** |
| DINNER×WEEKEND | -.04 (.00)*** | -.04 (.00)*** | -.04 (.00)*** | -.03 (.00)*** | -.04 (.01)*** | -.04 (.01)*** |
| Interactions with covariates | | | | | | |
| LUNCH×COV | -.00 (.00)*** | -.00 (.00)*** | -.02 (.00)*** | -.02 (.00)*** | .05 (.00)*** | .05 (.00)*** |
| DINNER×COV | -.00 (.00)*** | -.00 (.00)*** | -.02 (.00)*** | -.02 (.00)*** | .04 (.00)*** | .04 (.00)*** |
| WEEKEND×COV | | **-.00 (.00)** | | **.03 (.00)*** ** | | **-.00 (.01)** |
| LUNCH×WEEKEND×COV | | .00 (.00) | | -.03 (.01)*** | | .00 (.00) |
| DINNER×WEEKEND×COV | | .00 (.00) | | -.03 (.01)*** | | .00 (.00) |
| Individuals | 2,607 | 2,607 | 2,607 | 2,607 | 2,607 | 2,607 |
| Meals | 7,731 | 7,731 | 7,731 | 7,731 | 7,731 | 7,731 |
| Observations | 49,206 | 49,206 | 49,206 | 49,206 | 49,206 | 49,206 |

* p<.05, ** p<.01, *** p<.001

Note: Results from the multilevel mixed-effects regressions with variety seeking across days as the dependent variable. The bolded coefficient in M4, M6 and M8 represent the simple effect of hedonic goals for breakfast controlling not only for the covariate but also for the interactions between that covariate and the independent variable, i.e. the meal dummies (Yzerbyt et al. 2004). We included all two-way and three-way interactions in M5, M7 and M9 where the bolded coefficients represent the moderating role of the covariate on the meal * goal -> variety relationship. See W12 for a summary of the interaction analyses reported in M5/7/9.

## Supplementary Material 12. Mediating Role of Time Spent Eating in Study 1B

We examined whether the simple effect of weekend on variety seeking was mediated by time spent eating. First, we estimated a regression with time as the dependent variable and meals and weekend as the independent variables. The interactions between weekend with meal dummies are significant (respectively*:* $\beta = 9.20$, $z = 18.20$, $p < .001$ and $\beta = 7.06$, $z = 14.00$, $p < .001$). The simple effect of weekend is significant for all meals although smaller for breakfast ($\Delta = 2.35$ minutes, $z = 6.49$, $p < .001$) than for lunch ($\Delta = 11.54$ minutes, $z = 32.68$, $p < .001$) or dinner ($\Delta = 9.41$ minutes, $z = 26.72$, $p < .001$). Next, the simple effect of time spent eating on variety seeking over time was significant for breakfast ($\beta = .001$, $z = 11.52$, $p < .001$) but not for lunch ($\beta = .000$, $z = .50$, $p = .62$) or dinner ($\beta = .000$, $z = .71$, $p = .47$). Last, we also estimated the 95% CI for the indirect effects of weekend on variety seeking across days through time spent eating for the three different meals, using 1000 clustered bootstrap sample. The indirect effects of weekend were significant for breakfast ($\beta = .0029$, 95% CI: .0018 to .0039) but not for lunch and dinner ($\beta = .0002$, 95% CI: -.0001 to .0004; and $\beta = .0002$, 95% CI: -.0000 to .0004).

**Supplementary Material 13. Summary of the Moderating Role of Situational Covariates**

| | Study | Time | Others | Home |
|---|---|---|---|---|
| Moderating role of covariate on the meal * goal -> variety relationship | Study 1B[a] | p=.11 | Increase in variety seeking over time in the weekend is stronger in the presence of others (b=.03, z=6.92, p<.001) | p=.51 |
| | Study 2[b] | p=.40 | p=.16 | p=.25 |

[a]: Weekend × covariate interaction, including all two and three-way interactions

[b]: Perceived hedonic goal × covariate interaction, including all two and three-way interactions

## Supplementary Material 14. Detailed results from Study 2

**Panel A: Direct effects and central prediction**

| **Model number** | **Model 1**<br>**Coef (se)** | **Model 2**<br>**Coef (se)** | **Model 3**<br>**Coef (se)** |
|---|---|---|---|
| **Hypotheses** | **Direct effect of meals without covariates** | **Direct effect of meals with covariates** | **Central prediction** |
| Intercept | 4.23 (.13)*** | 3.57 (.25)*** | 3.16 (.27)*** |
| Meal occasions | | | |
| LUNCH (vs. breakfast) | .96 (.13)*** | .77 (.13)*** | 1.14 (.24)*** |
| DINNER (vs. breakfast) | 1.63 (.12)*** | 1.08 (.13)*** | 1.94 (.25)*** |
| Measured hedonic (vs. utilitarian) goals | | | |
| HEDONIC GOAL | | .07 (.03)* | .24 (.03)*** |
| Covariates | | | |
| WEEKEND | | -.04 (.08) | -.06 (.08) |
| TIME | | .25 (.07)*** | .25 (.07)*** |
| OTHERS | | .79 (.13)*** | .77 (.13)*** |
| HOME | | -.27 (.16) | -.30 (.16)* |
| Interactions with hedonic goals | | | |
| LUNCH×HEDONIC GOAL | | | -.14 (.07)* |
| DINNER×HEDONIC GOAL | | | -.26 (.06)*** |
| Individuals | 199 | 199 | 199 |
| Observations | 896 | 896 | 896 |

* p<.05, ** p<.01, *** p<.001

Note: Results from the multilevel mixed-effects regressions with variety seeking across days as the dependent variable. The bolded coefficient in M3 represents the simple effects of hedonic goals for breakfast ($\beta$=.24, $z$=4.40, $p$<.001). As expected, the simple effects are smaller for lunch ($\beta$=.10, $z$=2.15, $p$=.03) and dinner ($\beta$=-.02, $z$=-.50, $p$=.62).

## Supplementary Material 14. Detailed results from Study 2 (continued)

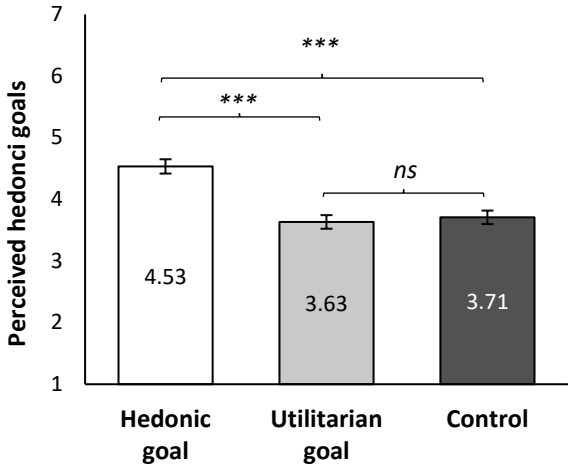
**Panel B: Detailed analyses including control variables**

| **Model number** | **Model 4 COV=time Coef (se)** | **Model 5 COV=time Coef (se)** | **Model 6 COV=others Coef (se)** | **Model 7 COV=others Coef (se)** | **Model 8 COV=home Coef (se)** | **Model 9 COV=home Coef (se)** |
|---|---|---|---|---|---|---|
| Intercept | 3.02 (.30)*** | 3.27 (.21)*** | 3.10 (.28)*** | 2.98 (.29)*** | 3.90 (.39)*** | 4.41 (.60)*** |
| Meal occasions | | | | | | |
| LUNCH (vs. breakfast) | .97 (.33) | .83 (.57) | 1.22 (.26)*** | 1.34 (.30)*** | .32 (.42) | .07 (.66) |
| DINNER (vs. breakfast) | 2.33 (.34)*** | 2.61 (.23)*** | 2.01 (.27)*** | 2.13 (.35)*** | .88 (.48) | .56 (1.01) |
| Measured hedonic (vs. utilitarian) goals | | | | | | |
| HEDONIC GOAL | **.24 (.05)*** ** | .16 (.11) | **.24 (.06)*** ** | .28 (.07)*** | **.23 (.05)*** ** | .07 (.15) |
| Covariates | | | | | | |
| WEEKEND | -.07 (.09) | -.08 (.09) | -.07 (.09) | -.07 (.09) | -.06 (.09) | -.06 (.09) |
| TIME | .32 (.20)** | .17 (.20) | .25 (.07)*** | .25 (.07)*** | .25 (.07)*** | .27 (.07)*** |
| OTHERS | .77 (.13)*** | .77 (.13)*** | .95 (.22)*** | 1.43 (.40)*** | .77 (.13)*** | .78 (.13)*** |
| HOME | -.27 (.15) | -.25 (.15) | -.30 (.15)* | -.31 (.15)* | -1.08 (.33)** | -1.70 (.62)** |
| Interactions with hedonic goals | | | | | | |
| LUNCH×HEDONIC GOAL | -.14 (.06)* | -.09 (.15) | -.14 (.07)* | -.19 (.08)* | -.13 (.07)* | -.05 (.17) |
| DINNER×HEDONIC GOAL | -.25 (.06)*** | -.30 (.15)* | -.36 (.06)*** | -.30 (.09)** | -.24 (.06)*** | -.13 (.22) |
| Interactions with covariates | | | | | | |
| LUNCH×COV | .08 (.14) | .17 (.28) | -.24 (.26) | -.67 (.51) | .89 (.38)* | 1.13 (.71) |
| DINNER×COV | -.19 (.13) | -.26 (.26) | -.23 (.25) | -.68 (.53) | 1.10 (.42)** | 1.44 (1.03) |
| HEDONIC GOAL ×COV | | **.04 (.05)** | | **-.16 (.11)** | | **.18 (.16)** |
| LUNCH× HEDONIC GOAL ×COV | | -.03 (.07) | | .15 (.14) | | -.08 (.19) |
| DINNER× HEDONIC GOAL ×COV | | .01 (.06) | | .16 (.14) | | -.13 (.23) |
| Individuals | 199 | 199 | 199 | 199 | 199 | 199 |
| Observations | 896 | 896 | 896 | 896 | 896 | 896 |

* p<.05, ** p<.01, *** p<.001

Results from the multilevel mixed-effects regressions with variety seeking across days as the dependent variable. The bolded coefficient in M4, M6 and M8 represent the simple effect of hedonic goals for breakfast controlling not only for the covariate but also for the interactions between that covariate and the independent variable, i.e. the meal dummies (Yzerbyt, Muller, & Judd, 2004). We included all two-way and three-way interactions in M5, M7 and M9 where the bolded coefficients represent the moderating role of covariate on the meal * goal -> variety relationship. See W12 for a summary of the interaction analyses reported in M5/7/9.

**Supplementary Material 15. Manipulation checks in Study 3**



## Supplementary Material 16. Robustness checks in Study 3

The hedonic conditions vs. utilitarian condition contrast as well as the hedonic condition vs. control condition contrast hold (respectively $\beta$ = -1.14, $z$ = -2.96, $p$ = .003; $\beta$ = -1.09, $z$ = -2.80, $p$ = .005) when also including the three covariates we measured in this study. Note that the location where breakfast would be eaten ($\beta$ = .23, $z$ = .68, $p$ = .50), the presence of others ($\beta$ = .-24, $z$ = -.54, $p$ = .59) and morning arousal ($\beta$ = .28, $z$ = 1.24, $p$ = .21) had no direct effect on variety seeking. We also estimated a model including interaction terms between a manipulation dummy (0 = hedonic goal vs. 1 = two other conditions) and the three covariates. None of the interaction terms were significant (home consumption: $\beta$ = .85, $z$ = .98, $p$ = .33, presence of others: $\beta$ = .54, $z$ = .74, $p$ = .46, morning arousal: $\beta$ = .20, $z$ = .41, $p$ = .68).

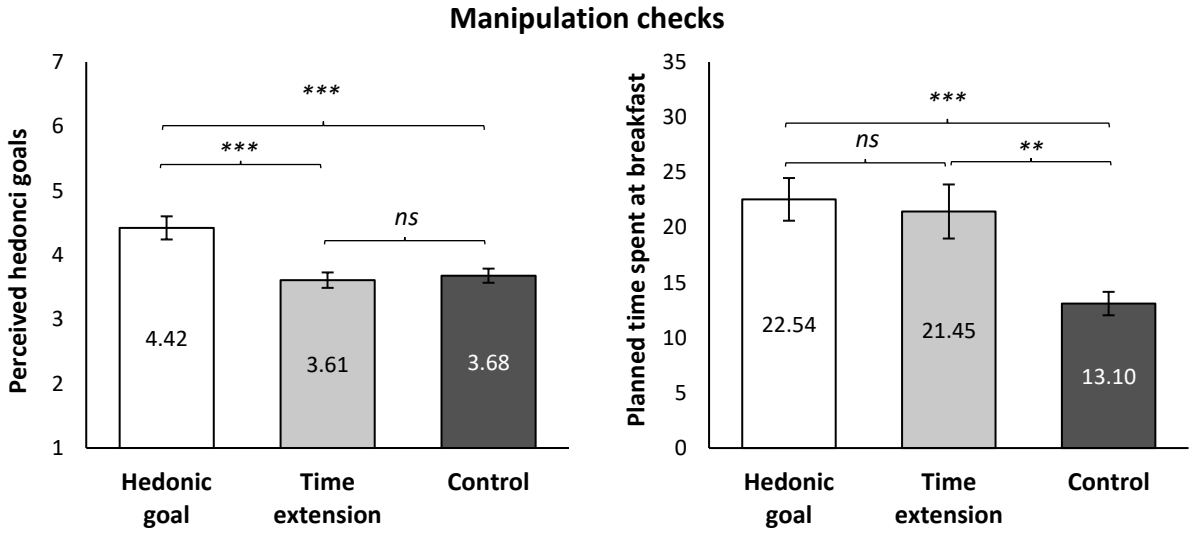
## Supplementary Material 17: Comparing Hedonic and Temporal Interventions

We propose that the pursuit of a hedonic goal is the primary psychological driver of variety seeking for that meal, which may also have spillover effects on the time spent preparing and eating that meal. In other words, time spent eating plays an intermediary role between goals and variety seeking, a finding that elucidates its effects in previous treatments of this subject (Khare & Inman, 2006, p.568). Support for our account is provided by the results of Study 1B and Study 2, where we found that the increase in variety seeking for weekend meals may be due to a sequential process involving an increase in hedonic goals followed by an increase in time spent eating. Furthermore, we found in Study 2 that the alternative serial mediation process was not significant. Time spent eating did not influence goals. In Study 4B, we directly compared the effects of an increase in the hedonic goal pursued for breakfast against an increase in time allocated to a meal in their effects on variety seeking at breakfast. Our theory predicts that only the hedonic goal intervention condition will increase variety seeking for breakfast.

*Method*. One hundred and eighty Amazon Mechanical Turk workers residing in the United States (40% female, $M_{age}$ = 33.95, *SD* = 10.23) were randomly assigned, on a Monday, to one of three conditions: controls ($n$ = 61), hedonic goal intervention ($n$ = 57), or temporal intervention ($n$ = 62).

In a control condition, participants were instructed, “Your objective for tomorrow: we would like you to eat breakfast.” In a hedonic goal intervention condition, participants were instructed, “Your objective for tomorrow: we would like you to maximize your enjoyment with a pleasurable and savory breakfast.” In a temporal intervention condition, participants indicated the number of minutes they typically spend eating breakfast on Tuesdays, using a slider with endpoints, 0 and 60 minutes. Participants were then instructed to spend 60% more time than they

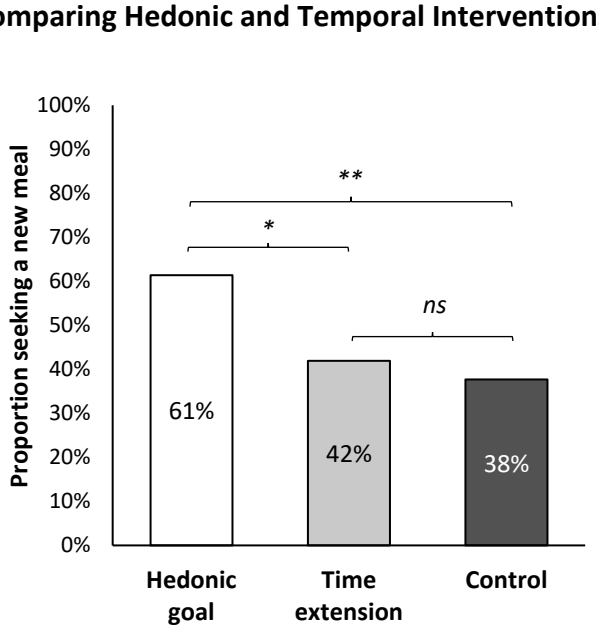
indicated on their breakfast the next day. For example, “Your objective for tomorrow: please spend 60% more time that you would normally, on your breakfast tomorrow. In other words: 24 minutes.” While the observed increase in time spent eating for breakfast from week to weekend was 10% in Study 1B, we increased the goal to 60% to increase the potential effect size of the intervention and maximize the possibility of observing an effect. The dependent measures, control variables, and manipulation checks were identical to those collected in Study 3.




*Manipulation checks.* A manipulation check on hedonic goals revealed a significant main effect ($F(2,177) = 12.53$, $p < .001$), see above. Hedonic goals were significantly greater in the hedonic goal intervention condition ($M = 4.42$, $SE = .13$) compared to the temporal intervention condition ($M = 3.76$, $SE = .11$, $\beta = -.81$, $t = -4.56$, $p < .001$), and control condition ($M = 3.75$, $SE = .11$, $\beta = -.74$, $t = -4.12$, $p < .001$). There was no difference between the temporal intervention and the control conditions ($\beta = .07$, $t = .39$, $p = .70$).

The manipulation check on predicted time spent preparing and eating revealed a significant main effect ($F(2,177) = 7.32$, $p < .001$). Predicted time spent at breakfast in the hedonic goal condition ($M = 22.54$ min, $SE = 1.96$) was greater than in the control condition ($M =$

13.10 min, *SE* = 1.90, $\beta$ = -9.45, *t* = -3.46, *p* = .001) but was not different than in the temporal intervention condition (*M* = 21.44 min, *SE* = 1.88, $\beta$ = -1.10, *t* = -.40, *p* = .69). There was a significant difference between the temporal intervention and the control conditions ($\beta$ = -8.35, *t* = -3.13, *p* = .002).




*Results.* As a test of our second hypothesis, we conducted a logistic regression similar to study 3. There was a significant main effect of experimental conditions on variety ($\chi$(2) = 7.54, *p* = .02). Consistent with our prediction, planned contrasts show that the hedonic goal intervention increased variety seeking over time compared to the temporal intervention condition ($\beta$ = -.79, *z* = -2.11, *p* = .03) and the control condition ($\beta$ = -.97, *z* = -2.55, *p* = .01). The results are shown above. Note that we find no differences between the temporal intervention condition and the control condition (*p* = .63).

*Robustness checks.* The two contrasts hold (respectively $\beta$ = -.86, *z* = -2.25, *p* = .02; $\beta$ = -1.07, *z* = -2.73, *p* = .006) when also including the three covariates we measured in this study. Note that the location where breakfast would be eaten ($\beta$ = 1.10, *z* = 1.73, *p* = .08), the presence

of others ($\beta$ = .16, $z$ = .42, $p$ = .67) and morning arousal ($\beta$ = -.04, $z$ = -.21, $p$ = .84) had no direct effects on variety seeking. We also estimated a model including interaction terms between a manipulation dummy (0 = hedonic goal vs. 1 = two other conditions) and the three covariates. None of the interaction terms were significant (home consumption: $\beta$ = -15.66, $z$ = -.01, $p$ = .99, presence of others: $\beta$ = -.49, $z$ = -.59, $p$ = .55, morning arousal: $\beta$ = .22, $z$ = .44, $p$ = .66).

*Discussion*. With regards to the influence of hedonic goal pursuit and time spent on preparing and eating meals, in Study 3, the hedonic goal intervention and time extension intervention both lead consumers to allocated similarly greater amounts of time to breakfast. Whereas the hedonic goal intervention did increase variety seeking across days for breakfast, however, the time extension intervention did not. Together with the results from Study 1B and Study 2, the results suggest reinterpretation of the relationship between time spent eating and variety seeking at meals. The results suggest a serial process whereby an increase in the pursuit of hedonic goals increases time spent on a meal, and in turn, increases the variety sought at it.

**Supplementary Material 18. Downstream consequences of increase in variety over time**

We computed the proportion of fruits and vegetable items eaten per meal relative to the total number of items per meal (of each day, for each panelist). Then, we estimated a multilevel regression on the proportion of fruits and vegetables with meals and variety seeking over time as predictors. We found that variety seeking had a positive main effect on the relative consumption of fruits and vegetables ($\beta$ = .02, $z$ = 11.91, $p$ < .001). Next, we estimated a moderated mediation model to examine the influence of the simple effects of our hedonic goal proxy (weekend vs. week) for the three meals on fruit and vegetable consumption through variety seeking across days. The indirect effect of the hedonic goal proxy (weekend vs. week) on fruit and vegetable consumption through variety was stronger for breakfast ($\beta$ = .005, 95% CI: .0036 to .0062) than for lunch ($\beta$ = .002, 95% CI: .0011 to .0025) and for dinner ($\beta$ = .000, 95% CI: .0001 to .0007).