Supplementary Materials

S.1. Number of fixations on objects of interest analysis

In addition to the analysis of fixation time proportions presented in the Results section, we also extracted and analyzed the number of fixations (normalized per minute) on each object of interest. Due to the collinearity between these two gaze features, the results showed highly similar patterns. To maintain clarity and conciseness, these additional analyses were omitted from the main text.

S.1.1. Free-viewing tablet task:

For the free viewing tablet task, it was observed that the number of fixations on the phone was mainly affected by the experimental condition [F(2,46)= 192.64,p < .001, η^2 = .89]. Unsurprisingly, the number of fixations on the phone was higher for both the left [t(1,23) = 15.81, p <.001, d = 3.84] and right [t(1,23) = 17.97, p <.001, d = 4.37] phone position conditions than when the phone was not present. The number of times participants looked at the phone was higher when the phone was placed on the right side of the food tray than on the left [t(1,23) = 2.16, p < .05, d = .52].

There was a main effect of the phone position on the number of time the plate was looked at [F(1.50,34.62) = 36.88, p < .001, η^2 = .61]. The post-hoc tests revealed that when the phone was absent, the number of time the plate was fixated was higher than when the phone was present at the left [t(1,23) = 7.21, p < .001, d = 1.70] and right [t(1,23) = 7.64, p < .001, d = 1.80] sides of the food tray. No difference was found between the left and right phone position in terms of the number of time the plate was fixated [t(1,23) = .43, p > .05, d = .10].

The phone position did not yield a main effect on the number of time the background was fixated by the participants [F(2,46)= 2.49,p > .05, η^2 = .09].

There was an effect of phone position on the number of time lateral objects were fixated [F(2,46)= 25.82 ,p < .001, η^2 = .53]. Post-hoc tests revealed that the number of fixations on the lateral objects close to the phone was higher than the objects that were on the opposite side [t(1,23) = 7.18, p < .001, d = 1.88]. Similarly, the number of fixations on the lateral objects close to the phone was higher than the number of fixations on these objects when there was no phone [t(1,23) = 3.75, p < .001, d = .98]. The number of time the lateral objects were explored was lower when they were on the opposite side of the phone as compared to the same objects when the phone was absent [t(1,23) = 2.43, p < .01, d = .90].

S.1.2. Meal eating:

In the meal eating condition, a main effect of the phone position was observed on the number of times the phone was looked at [F(1.59,36.65)= 80.33,p < .001, η^2 = .77]. Unsurprisingly, the number of fixations on the phone was higher when the phone was either on the left [t(1,23) = 11.89, p < .001, d = 3.29] or right [t(1,23) = 9.74, p < .001, d = 2.69] than when it was absent. The number of fixations on the phone was significantly higher when the phone was positioned on the left than on the right side of the food tray [t(1,23) = 2.15, p < .05, d = .59].

Food: There was no effect of the phone position on the proportion of time the plate was looked at [F(2,46)= 1.08,p > .05, η^2 = .04].

Background: The phone position did not yield a main effect on the proportion of time the background was fixated by the participants [F(2,46)= .87, p > .05, η^2 = .03].

Objects (phone side, absent, opposite side): There was an effect of phone position on the number of time lateral objects were fixated [F(1.55,35.80)= 26.47 ,p < .001, η^2 = .53]. Post-hoc tests revealed that the number of fixations on the lateral objects close to the phone was higher than the objects that were on the opposite side [$t(1,23) = 6.64$, $p < .001$, $d = 1.62$]. Similarly, the number of fixations on the lateral objects close to the phone was higher than the number of fixations on these objects when there was no phone [$t(1,23) = 5.88$, $p < .001$, $d = 1.43$]. No difference was found between the number of time the lateral objects opposite to the phone were fixated as compared to the same objects when the phone was absent [$t(1,23) = .76$, $p > .05$, $d = .18$].

S.2. Analysis of the initial visual exploration of the meal eating environment:

The gaze features (i.e. eccentricity and fixations within ROI distributions) reported for the meal eating conditions were extracted from the whole duration of the meal. In contrast, these measures were aggregated from series of 10 seconds-long single trials in the tablet conditions. The comparatively short presentation of visual stimuli on the tablet may explain the differences in the gaze distribution pattern observed when comparing to meal eating condition. More specifically, this short period of time may only allow sufficient time to quickly scan the visual scene and therefore is characterized by prototypical gaze patterns. In order to explore whether similar patterns can be found during a naturalistic visual experience, we extracted the gaze features within a period of 10 seconds preceding the meal eating. During these 10 seconds, participants were sitting still and were waiting for the experimenter to signal them to start eating. Interestingly, this short pre-meal period already reflects spatial biases that will be recorded throughout the course of the meal. It should be noted that, in contrast to the tablet conditions where features are averaged over 24 trials, only a single trial per participant could be extracted for each condition which largely explains the variance observed in this data (see Figure S1). Nonetheless, this analysis hints toward the relevance of extracting data preceding the onset of behaviors, as these periods reveal initial visual exploration of the elements of the environment which may provide valuable insight into how the task and environment are approached.

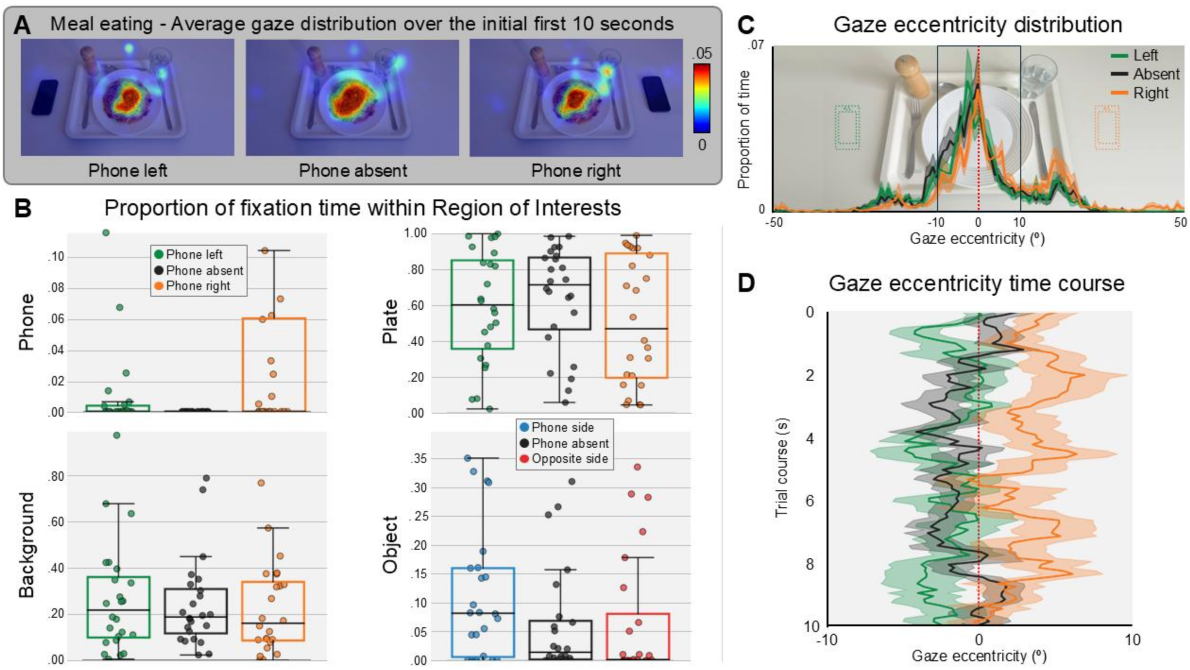

Figure S1. Gaze dynamics and visual exploration features recorded during the initial 10 seconds of the meal eating condition. The position of the phone was either at the left, absent, or at right side of a food tray. A. Grand average (N=24) gaze distribution heatmaps over the course of the meal for each condition (with the phone on the left, absent, and on the right of the food tray). B.

Proportion of fixation time to each object of interest (grinder, plate, glass, phone, and background) for each condition (phone on the left in green, phone absent in black, phone on the right in orange). C. Grand average distribution of gaze eccentricity over the course of the meal for each condition. The green and orange phones indicates the position of the phone for the phone left and phone right conditions respectively. D. Grand average gaze eccentricity time course over the initial 10 seconds of the meal where the phone position was left (in green), absent (in black), or right (in orange).

During the initial 10 seconds of the meal-eating period, participants spent significantly more time fixating on the phone when it was placed on the right side of the tray compared to the left [t(1,23) = 2.09, p < .05, d = .42]. In contrast, phone position had no significant effect on the proportion of time spent fixating on other areas of interest, including lateral objects [F(2,46)= 1.81, p > .05, η^2 = .07], the food [F(2,46)= 1.02, p > .05, η^2 = .04], or the background [F(2,46)= .21, p > .05, η^2 = .00].

S.3. Gaze eccentricity and motion sensors correlations

The relationships between signals recorded from gaze and motion sensors were assessed by computing Pearson correlation coefficients across all 72 meal eating datasets. Correlations were calculated between raw signals representing torso yaw rotation (C_GYRO_X), head yaw rotation (H_GYRO_Y), and horizontal gaze position (Gaze_X). On average, the absolute correlation between torso and head motion was low [r(71) = .09, SD = .07], as was the correlation between torso motion and gaze [r(71) = .04, SD = .03]. A slightly stronger correlation was observed between head motion and gaze data [r(71) = .15, SD = .09].

To examine the potential presence of temporal delays between signals, cross-correlations were computed for each signal pair. Signals were then realigned based on the lag associated with the peak cross-correlation to maximize phase-amplitude correspondence, and new correlation coefficients were computed. The absolute correlations for the realigned signals were lower than those observed in the raw data: torso–head [r(71) = .06], torso–gaze [r(71) = .03], and head–gaze [r(71) = .07]. This reduction suggests that the relationships between these signals are complex and potentially nonstationary, or that they are only partially synchronized and cannot be optimally aligned using a single global time shift.

S.4. PUMP questionnaire items scores descriptive statistics

The table below presents the descriptive statistics (mean and standard deviation) for each item of the Problematic Mobile Phone Use (PUMP) scale.

Problematic Mobile Phone Use (PUMP) scale item	**Items scores (n=24)**	
	Mean	**Std. dev.**
I need more time using my smartphone to feel satisfied than I used to need.	1.167	0.381
When I stop using my smartphone, I get moody and irritable.	1.125	0.338
It would be very difficult, emotionally, to give up my smartphone.	1.875	0.680

The amount of time I spend using my smartphone keeps me from doing other important work.	2.417	0.717
I have thought in the past that it is not normal to spend as much time using a smartphone as I do.	2.417	1.060
I think I might be spending too much time using my smartphone.	2.958	1.122
People tell me I spend too much time using my smartphone.	1.167	0.482
When I am not using my smartphone, I am thinking about using it or planning the next time I can use it.	1.25	0.532
I feel anxious if I have not received a call or message in some time.	2.25	0.989
I have ignored the people I’m with in order to use my smartphone.	1.083	0.282
I have used my smartphone when I knew I should be doing work/schoolwork.	3.958	0.690
I have used my smartphone when I knew I should be sleeping.	4.333	0.816
When I stop using my smartphone because it is interfering with my life, I usually return to it.	2	1.103
I have gotten into trouble at work or school because of my smartphone use.	1.292	0.464
At times, I find myself using my smartphone instead of spending time with people who are important to me and want to spend time with me.	1.042	0.204
I have used my smartphone when I knew it was dangerous to do so.	1.333	0.761
I have almost caused an accident because of my smartphone use.	1.167	0.381
My smartphone use has caused me problems in a relationship.	1.042	0.204
I have continued to use my smartphone even when someone asked me to stop.	1.125	0.338