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2 RUNNING HEAD: READING THE PLATE

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5 **Reading the plate**

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7 Prof. Charles Spence

8 Crossmodal Research Laboratory, Oxford University

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17 CORRESPONDENCE TO: Prof. Charles Spence, Department of Experimental Psychology,
18 Anna Watts Building, University of Oxford, Oxford, OX2 6GG, UK.

ABSTRACT

How do diners visually inspect the plate when it is first placed down in front of them? Do any regularities in the patterns of visual inspection across diners (such as reading from top-left to bottom-right) provide useful predictions concerning the way in which the element(s) on the plate should be arranged? In this review, I look at the evidence concerning the perceptual/interpretational biases that may be elicited by placing various food elements at different positions on the plate, focusing specifically on their left-right (i.e., lateral) arrangement. An analogy is drawn both with the patterns of eye-movements that have been documented in reading (e.g., the menu) and when people visually inspect paintings. Where relevant, comparisons are also made with the literature on the representation of food on/through product packaging. Taken together, the evidence suggests that while visual attention is typically drawn to the single item, or high energy-density item(s), on the plate, when multiple elements are presented, a left-to-right viewing bias is likely (at least amongst those who read from left-to-right). Understanding any such biases in ‘reading’, or visually-inspecting, the plate can presumably be used to help provide guidelines concerning the arrangement/interpretation of food elements. For instance, it has been reported that people prefer it when the direction of flow of images coincides with their own reading direction. Viewers also tend to prefer images when there is a higher density of items on the right than on the left. The question is raised as to whether a similar bias is also seen in aesthetic plating.

KEYWORDS: ART OF PLATING; SCIENCE OF PLATING; VISUAL ATTENTION; EYE MOVEMENTS; LATERALITY BIAS.

Introduction

How do diners ‘read’ the plate when a dish is first placed down in front of them? This would seem to be an increasingly relevant question as eye appeal, and hence the visual layout of a dish, becomes ever more important (Dornenburg & Page, 1996; Styler & Lazarus, 2006; see Spence, Okajima, Cheok, Petit, & Michel, 2016, for a review). Indeed, if the first taste really is with the eyes, as so many commentators have suggested (e.g., Apicius, 1936; Spence, 2017a; Van der Laan, de Ridder, Viergever, & Smeets, 2011), then surely it has to make sense to try and determine any regularities in where the diner’s eyes land first, and where they go thereafter (see also Martin, 2013). Relevant here, there is a long history as far as the art and science of plating is concerned (see Deroy, Michel, Piqueras-Fiszman, & Spence, 2014; Spence, Piqueras-Fiszman, Michel, & Deroy, 2014, for reviews), with scientific approaches increasingly being applied, both in realistic dining contexts (e.g., see Rowley & Spence, 2018; Zellner, Loss, Zearfoss, & Remolina, 2014), as well as, oftentimes, online (see Michel, Woods, Neuhäuser, Landgraf, & Spence, 2015).

There is also an intriguing link to painting here too, via the suggestion that the aesthetics of plating may be similar to those of painting (see Spence, 2017b, in press a).¹ Paintings, or so it has been suggested, are ‘read’ from left to right (Gaffron, 1950; Wölfflin, 1941, p. 82). For instance, according to Gaffron, Westerners scan paintings in a consistent fashion, starting in the lower left foreground and sweeping up and to the right in the picture space. According to Gaffron’s influential early report, this typical scan-path might then explain why it is that artists and critics seem to prefer those paintings whose areas of interest are shifted to the right of centre (see also Freimuth & Wapner, 1979). Is the same true when a diner first inspects an aesthetically interesting plate of food, one might ask?

A preference for the ascending to the right organization

Knowing how people ‘read the plate’ is important given that it may determine how they interpret certain elements in a dish. Just take the suggestion that diners/viewers/consumers read an oblique (i.e., diagonal) line (going from bottom left to top-right) as ‘ascending to the right’

¹ El-Khoury (2004, p. 308) captures the idea when he writes: “*In the ambigu, the temporal succession of multiple courses is thus eliminated in favour of the visual effect of a unified tableau. Such meals are composed as a spectacle for the eyes They are modelled after painting, sculpture, and architecture and conform to those arts’ “rules” of visual composition.*”

rather than as ‘descending to the left’ (see Arnheim, 1974; Kandinsky, 1925, 1977). Along similar lines, researchers in marketing argue that product logos that ascend to the right are more likely to be associated with notions of activity in the mind of consumers than those that ascend to the left (Schlosser, Rikhi, & Dagogo-Jack, 2016).² Furthermore, research in which people indicated their preferred orientation for aesthetically attractive plates of food have documented a preference for the ascending-to-the-right orientation too (see Youssef, Juravle, Youssef, Woods, & Spence, 2015). A preference for the ascending to the right orientation has sometimes also been demonstrated when people view a linear element (such as a piece of pasta) on the front of product packaging (Velasco, Woods, & Spence, 2015). A striking example of this plate arrangement is shown in **Figure 1**, showing a plate of *Risotto con Ossobuco alla Milanese*, as created by chef Roberto (Bobo) Cerea at the Carlton Hotel St. Moritz.

INSERT FIGURE 1 ABOUT HERE

Here, though, it is worth noting that according to an alternative account, the ascending to the right preference might also be explained in terms of embodied mental simulation (see Spence, in press a). The idea being that our brain tends to simulate the act of consuming the foods we see (even if we are just staring at a food image on a screen; though see Spence, 2011). Hence any presentation of food that makes it easier to simulate the act of eating will likely be preferred (see Elder & Krishna, 2012), and may also benefit from delivering a more ‘fluent’ perceptual/processing experience (see Reber, 2012; Winkielman, Ziembowicz, & Nowak, 2015). The assumption in this case being that the majority of diners are right-handed, and even regardless of handedness, the knife is typically held in the right hand and the fork in the left, at least initially. According to a growing body of research, the viewer’s brain is thought to simulate the act of eating a dish whenever it sees food, even if displayed on an advert, product package, or computer screen (see Petit, Velasco, & Spence, 2018). What is more, the research also shows that sensorimotor-fluent actions convey positive affect (Cannon, Hayes, & Tipper, 2010).

How do viewers inspect paintings?

² On the flip side, though, one might also consider whether there are any situations where the ‘negative’ reading of the bottom-right to top-left arrangement might help convey, or match a certain desired aesthetic outcome, as, for example, seen in Caravaggio’s famous painting ‘The_conversion_de_Saint_Paul’.

There have been several quantitative studies of eye-movements when people view paintings (e.g., Spinney, 2000; Yarbus, 1967). For instance, intriguing classic research by Yarbus, demonstrated that the typical pattern of eye-movements is by no means fixed, but rather depends on the question that the subjects (nowadays participants) had been asked about the painting (e.g., Waligórska, 2006; see **Figure 2**). One potentially important difference here though between plating and painting is that the frame of the plate normally tends to be round, perhaps immediately focusing interest in the centre of the dish. Indeed, the art critic Arnheim once described the frame of the painting as a “structural skeleton.” One might therefore reasonably consider whether the rim of the plate serves much the same function—that is, of constraining how what falls within that “frame” is evaluated (or inspected visually). As Arnheim (1988, p. 2) noted some years ago: *“The most radical promoters of centric composition are the round enclosures—circular frames, disks, spherical volumes. Such fully symmetrical structures are entirely determined by their focus in the middle.”* According to such a view, one might expect that a diner’s visual attention would immediately be focused on whatever happens to be at the centre of the plate.³ Here, it is perhaps worth noting that given the predominantly white tableware, and white tablecloths, that the centring effect of circular plate frame is likely to be somewhat less apparent than when a colourful tablecloth, or plateware, is set against a white plate, or white tablecloth, respectively (the latter arrangement presumably helping to enhance contrast of a circular frame). However, I am not aware of any research that has specifically addressed possible interactions at this level on how people visually inspect the plate.

INSERT FIGURE 2 ABOUT HERE

Perhaps consistent with Arnheim’s (1988) suggestion, in our latest research, we have repeatedly found that when a simple dominant linear element is placed in the centre of the plate, viewers prefer a canonical orientation (i.e., horizontal or vertical) for that element (see Spence et al., submitted). Of course, if there is only a single foreground element on the plate, then the diner’s attention will presumably be immediately drawn to that, as the only item of interest in the scene. Under such conditions, a preference for a canonical orientation (i.e., horizontal or vertical) may reflect the fact that the plate looks balanced/stable in such a configuration (see

³ By contrast, the rectangular frame of most paintings does not offer any such centring frame. Intriguingly here, when the Kandinsky on a plate dish (a salad plated to imitate one of Kandinsky’s paintings; see Michel, Velasco, Gatti, & Spence, 2014) was rotated by participants into their preferred orientation, a canonical orientation (either horizontal or vertical) was preferred (over oblique) by the majority of participants (see Spence, Michel, Youssef, & Woods, submitted).

also Locher & Nagy, 1996; McManus, Stöver, & Kim, 2011). Indeed, according to Latto, Brain, and Kelly (2000, p. 986), people prefer horizontal and vertical lines “*because they are perceptually more powerful*”, thus facilitating processing.

Under those conditions in which there are multiple discrete elements, however, the relation between them starts to become more salient/important, and hence a preference for linear elements ascending to the right may well be observed. This changing preference might perhaps be attributable to the emergence of what has been referred to as ‘dynamic balance’ (see Wilson & Chatterjee, 2005). Indeed, as soon as a more complex multi-element food composition is presented to participants, a preference for an oblique orientation, with the linear element ascending to the right is often seen (e.g., Youssef et al., 2015). Consistent with this as the preferred orientation, one also finds ‘Modern pastry and plated desserts techniques’ (n.d.), suggesting the ascending to the right organization based on flow (i.e., assuming a viewer who is ‘reading’ the plate from left-to-right).

Is visual attention first captured by the most energy-dense food on the plate?

A reasonably large body of empirical research shows that our attention is drawn to the most energy-dense foods in a scene (e.g., Harrar, Toepel, Murray, & Spence, 2011; Sawada, Sato, Toichi, & Fushiki, 2017; Toepel, Knebel, Hudry, Lecoutre, & Murray, 2009). For example, Sawada et al. recently demonstrated that the fat content of images of fast food and typical food items from the Japanese diet captured visual attention. Specifically, faster target detection latencies were reported when the target was a high-fat hamburger (presented in-amongst non-food distractors) than when it was low-fat food item from Japanese diet (e.g. manju, a bun with bean-jam filling). On the basis of this literature, one might therefore expect that a diner’s visual (overt) attention would be directed to that energy-dense food first, should there be multiple elements on the plate. Of course, having ascertained where visual attention is likely to start off, the question then becomes one of how many further eye-movements (saccades) and fixations are made as a diner ‘reads’ their plate. At the same time, one might also wonder how the observer (or diner) ensures that they do not end-up fixating on a part of the scene (or plate) that they have already looked at. The phenomenon of inhibition of return would appear to help (see Posner & Cohen, 1984). The suggestion here being that our brain leaves an inhibitory tag at

those locations that we have fixated recently, thus biasing our visual scanning behaviour toward new locations in the visual scene (see Klein & MacInnes, 1998).⁴

However, despite the breadth of evidence concerning visual attentional capture when people are viewing food images (see also Du & MacDonald, 2015; Piqueras-Fiszman, Velasco, Salgado-Montejo, & Spence, 2013), it is worth noting that the majority of the eye-movement literature in this area has tended to focus on any differences between normal weight and obese individuals in terms of where they look when presented with food-related stimuli (see Castellanos, Charboneau, Dietrich, Park, Bradley, Mogg, et al., 2009; Hummel, Zerweck, Ehret, Winter, & Stroebele-Benschopa, 2017; Wang, Cakmak, & Peng, 2018; Werthmann, Jansen, & Roefs, 2016; Werthmann, Roefs, Nederkoorn, Mogg, Bradley, & Jansen, 2011; Yokum, Ng, & Stice, 2011). It is worth stressing here that the focus of a diner's visual attention (no matter whether they happen to be obese or otherwise) is likely to be somewhat different given that once a plate of food is placed down in front of them it becomes 'theirs' – and hence there is no pressure to decide on what they want (cf. Wang, Volkow, Telang, Jayne, Ma, Rao, Zhu, Wong, Pappas, Geliebter, et al., 2004; Small, Veldhuizen, Felsted, Mak, & McGlone, 2008, on the difference between anticipatory and consummatory food behaviours, neurally-speaking).⁵

Reading the menu

How diners 'read' different parts of their dining experience has been the subject of eye-movement research. The research that has been published to date, though, has mostly tended to focus on trying to identify any 'sweet' spots on the restaurant menu (see Spence & Piqueras-Fiszman, 2014, for a review). **Figure 3** highlights the typical scan-path on a two-page menu (see Gallup, 1987; Main, 1994; McVety, Ware, & Ware, 2009; Von Keitz, 1988). However, here it is important to note that there is something of a controversy concerning the results of eye-tracking studies in this area, with different typical scan-paths being reported by different researchers. The Gallup Organisation (1987), for instance, published the results of a study in

⁴ It is worth noting that there may also be insights to be had from changes in pupil diameter (potentially signalling changes in arousal state of the viewer; Graham, Hoover, Ceballos, & Komogortsev, 2011; Wang, Cakmak, & Peng, 2018). It would certainly be interesting to investigate whether pupil changes are observed when guests are given a gustatory surprise (see Velasco, Michel, Youssef, Gamez, Cheok, & Spence, 2016b), or else experience an 'aesthetic aha' in relation to the dish that they have been served (Spence & Youssef, 2016).

⁵ And although beyond the purely visual scope of the present study, one might also want to consider how auditory cues might differentially direct attention within a scene (Knoeflerle, Knoeflerle, Velasco, & Spence, 2016).

which it was reported that a diner's scanpath when inspecting a restaurant menu is more like what is seen when reading a book (i.e., going from top to bottom on the left page, and then doing the same thing on the right page). Yang (2012) too obtained a book-like pattern of gaze shifts when using the latest in eye-tracking technology.⁶ That said, it is worth remembering that highlighting is sometimes used as a means of deliberately drawing the customer's eye to the star dishes or other high value items on the menu (see Poundstone, 2010; Spence & Piqueras-Fiszman, 2014), and this may disrupt or 'hack' the visual scan-paths that might typically be seen when people scan a uniform menu.

INSERT FIGURE 3 ABOUT HERE

Should there be predictable patterns in the scanning of plates then one might use that information when providing guidelines concerning how to arrange the elements on the plate. This is certainly the logic that applies as far as optimizing the layout of the menu is concerned. The intuitive suggestion being that diners, perhaps unsurprisingly, are more likely to order those items that they have spent more time fixating visually prior to ordering (e.g., Carmin & Norkus, 1990; Reynolds, Merritt, & Pinckney, 2005). Though, that said, it is worth noting that there is an interesting empirical question here concerning the precise nature of the link(s) between gaze behaviour and consumer choice (e.g., Orquin & Mueller Loose, 2013; Shimojo, Simion, Shimojo, & Scheier, 2003). Bear in mind also that there may be differences based on whether people are choosing which of several options they want (Onuma, Penwannahkul, Fuchimoto, & Sakai, 2017), or else when deciding the 'meaning' of that which they have already chosen (and hence when they are merely interpreting the meaning, or contents). See Spence and Youssef (2016) for one such example of a dish where the majority of diners took some time visually inspecting the dish before the 'meaning', or hidden image, emerged from the plate.

Side effects

We saw earlier how people apparently prefer paintings when the higher number (or density) of items is on the right rather than on the left (see also Banich, Heller, & Levy, 1989). Researchers have also looked at side effects in the case of food images on product packaging. There have

⁶ Of course, there is always the worry here that people may 'look' differently if they know that their eye-movements are being monitored.

also been studies concerning how to arrange the transparent windows in product packaging so as to optimize the eye appeal and implicit associations that consumers have with a product (e.g., see Simmonds, Woods, & Spence, 2018). In the case of packaging design, importance is placed on whether food items are placed on the left or right, top or bottom of the packaging facade. According to the packaging research published to date (e.g., Clement, 2007), one should think carefully as to whether a food image (or transparent window) is situated on the bottom-left versus top-right, say, as it really can convey very different meanings/associations (e.g., considering the healthiness, weight, or quality of the product; Deng & Kahn, 2009; Romero & Biswas, 2016; Simmonds, Woods, & Spence, 2018; Westerman, Sutherland, Gardner, Baig, Critchley, Hickey, Solway, & Zervos, 2013).⁷ Romero and Biswas provided support for the suggestion that food images on product packaging work better when healthy foods are placed on the left, while unhealthy foods work better on the right, thus matching a correspondence/implicit association that people appear to hold between laterality and perceived healthiness. Elsewhere, Simmonds and his colleagues (2018) demonstrated that online participants preferred products with transparent windows when the latter was on the top-right rather than the bottom-left. It currently remains an open question, though, as to whether any generalizations that emerge from the field of packaging design can be directly extended to provide meaningful insights into the world of plating. Once again, it should be remembered that the majority of product packages tend to be rectangular (i.e., like paintings) rather than round, like the majority of plates, and that as Arnheim (1988) noted, this might have an impact on the pattern of results that are observed.

Here, though, it is perhaps worth considering the Japanese bento lunchbox, which is traditionally rectangular, and served with the longer side close to the diner. Intriguingly, the Japanese chef will typically lay out their compartmentalized kaiseki trays such that the most desirable or costly food item is placed in the upper left, while the rice will often be located on bottom right (see Ekuan, 2000; Oshima & Cwiertka, 2006, on the secrets of kaiseki cuisine). Indeed, it has been suggested that Japanese chefs, along with Japanese landscape gardeners, believe that the eye goes first to the upper left, then the upper right, followed by the lower left

⁷ The vertical position of images on a plate or product packaging is also important (Dong & Gleim, 2018; Meier & Robinson, 2004; Van Rompay, Fransen, & Borgelink, 2014; though see also Velasco, Adams, Petit, & Spence, 2019; Simmonds et al., 2018). That said, a detailed discussion of verticality effects falls beyond the scope of the present study.

and finally lower right. Once again, one might consider how such organizational principles link to the direction of reading which in Japan is from top right to bottom left, reading in columns.

Left-right reversal in the visual arts

While those researchers working in the field of packaging design typically move images, or transparent windows, around the packaging and assess the visual effects on consumers, those working in the visual arts who are interested in laterality effects, and left-right differences, have typically presented viewers with paintings (and even, on occasion, movies), that have been left-right reversed instead, and assessed any differences in people's responses. Often, the aesthetics research has demonstrated that people give lower ratings to paintings that have been left-right reversed. For instance, Swartz and Hewitt (1970) had their participants indicate their preference for an original masterwork of Western painting or its mirror image. Intriguingly, these researchers documented a significant preference for the original images, with this bias being particularly pronounced for those paintings where there was great weight in the upper-right-hand quadrant of the work (presumably where the eye ends-up following left-to-right scanning across the image; see also Blount, Holmes, Rodger, Coltheart, & McManus, 1975; Gordon & Gardner, 1974).

Similarly, Levy (1976) reported that when a group of right-handed individuals preferred one orientation of an original slide over its mirror image, the centre of interest of the slide was normally rated as being displaced toward the right (by another group of right-handed observers). Intriguingly, however, the orientation preferences of left-handers were found to be unrelated to the asymmetry of picture content. According to Levy (1976, p. 442): '*... in viewing pictures, the right visuo-spatially specialized hemisphere is selectively activated producing a bias of attention toward and a psychological weighting of the left side of space. Pictures which correct for this imbalance by having their more important content or greater heaviness on the right are considered [. . .] to be more pleasing*' (see also Chen & Spence, 2017, for a review of hemispheric asymmetries in spatial attention). Meanwhile, Bertamini, Bode, and Bruno (2012) reported that the left-right reversal in two of Kurosawa's movies also affected people's interpretation of the movies (even though virtually none of the participants detected the reversal while viewing it at a screening).

Does the left-right reversal of aesthetically-plated food impact liking?

One might ask what would happen with photos of dishes? As far as I am aware, no one has conducted such research to date. It would, though, certainly be interesting to conduct a similar study with food images uploaded to sites such as Instagram's 'The Art of Plating' (see <http://theartofplating.com/>). That is, the idea would be to show large numbers pictures of aesthetically-plated dishes and their mirror image to participants online, and see whether the latter show any preference for the original orientation and, if so, whether a discernible cause for that preference can be ascertained. Similarly, visual inspection of asymmetrically-plated foods on websites such as the Art of Plating itself might be expected to reveal that when there is left-right asymmetry then the density of food items tend to be higher on the right than on the left.

While not the purpose of the underpinning research, it is also worth noting here that we have published a number of studies in which large numbers of people were asked in which orientation/arrangement they would prefer the food to be positioned on the plate. As a result, we have data that might be expected to reveal a preference, should one exist (e.g., Velasco, Michel, Woods, & Spence, 2016a). However, visual inspection of the results of the latter study, for instance, certainly does not reveal any such clear preference for there to be a higher density of food elements on the right of the plate. In one study, comparing balanced (i.e., centred) plating with unbalanced (i.e., asymmetrical plating), the latter asymmetry could result in the stimuli being shifted to the right or left on the plate. There was, however, absolutely no preference for those plates where the food was all positioned on one side rather than on the other (see **Figure 4**).

INSERT FIGURE 4 ABOUT HERE

It feels as if one can sometimes discern the handedness of the chef from the way in which a dish is plated. Hence another potentially relevant open question in this area concerns whether diners (aesthetically) prefer a plate if it has been created by someone who happens to share their own handedness. One might also wonder whether one side or the other is easier for left/right handers to plate. Also open here is the question of whether the diner's/viewer's handedness exerts any impact over people's appreciation of the plating of food (cf. Nachson, Argaman, & Luria, 1999). This discussion links back to questions of embodied mental simulation (Elder & Krishna, 2012). For, as mentioned earlier, diners imagine (or simulate) the act of consuming a dish prior to eating it (even if only staring at a picture of a dish). However,

one might wonder whether diners necessarily simulate the act of consumption (as is so often suggested) or the act of creation (or making) as has sometimes been muted (see also Beaumont, 1985; McLaughlin, 1986; Mead & McLaughlin, 1992, on handedness and visual aesthetic preferences).⁸ Separately, research from the world of painting reveals that aesthetic appreciation differs between experts (art critics) and novices (e.g., Lindell & Mueller, 2011). As such, one might wonder whether there are similar differences between food critics and regular diners? This is yet one more of the important questions for future research in the visual inspection of plating.

To what extent does reading direction influence aesthetic (plating) preferences?

Do people always ‘read’ the plate from left to right, for those reading western script? Pushing the reading metaphor further might lead to the suggestion that Japanese diners might exhibit a tendency to read the plate from top to bottom and right to left (see Chokron, Kazandjian, & De Agostini, 2009; see also Abed, 1991).⁹ Certainly, when the aesthetic preferences of Israeli readers, who read from right to left, have been assessed, they sometimes differ (on occasion, being left-right reversed) from those observed in left-to-right readers (Chokron & De Agostini, 2000). Chokron and De Agostini reported a study in which 162 participants were shown pairs of images, one the mirror image of the other. Half the participants were left-to-right readers (French), and the remainder were Israelis who read from right-to-left. The participants’ normal reading direction was forced to exert a significant influence over the preferred directionality of the stimuli displayed in pictures. That is, people preferred those images where the flow matched the flow of their reading. Should reading direction be found to influence plating preferences too, then perhaps a different arrangement of the elements on the plate really would make most sense depending on the viewer’s/diner’s normal reading direction (thus potentially playing into the personalized dining theme that is so popular these days; Spence, 2017a, Chapter 10). For instance, the chef might want their guest’s visual attention to start where their first interaction with the plate will occur. This suggestion is based on the fact that different orderings of

⁸ As advanced by Denis Dutton, philosopher of aesthetics, the value of a piece of art could be rooted in the assumption (or simulation) of the human effort underlying its creation (Dutton, 2009, p. 156).

⁹ Tall East Asian paintings that would seem to necessitate, or at the very least to encourage the viewer to scan vertically rather than horizontally. Chinese rolled scrolls, meanwhile, were to be read from right to left (Oppé, 1944).

taste/flavour sensations will likely be more or less desirable (see Spence, Wang, & Youssef, 2017, on the temporal order of tasting).

Conclusions

In conclusion, while there are a number of similarities between the way in which people scan plating, painting, and food packaging, it is important to note that there are also a number of potentially important differences too. The latter means that any easy translation from one field of research and/or format to the other is less than straightforward. While text is scanned from top-left to bottom right while the oft-made suggestion is that paintings (at least narrative paintings) are scanned from bottom-left to top-right (at least amongst Westerners; Gaffron, 1950; Oppé, 1944; Wölfflin, 1941). It is, though, worth stressing that while paintings and food product packaging are usually vertically arranged (thus, perhaps, emphasizing verticality; Cian, 2017; van Rompay, de Vries, Bontekoe, & Tanja-Dijkstra, 2012), plates are normally displayed lying horizontally on the table (where such cues to verticality are less obvious, if present at all).¹⁰ Second, both paintings and packaging typically have a rectangular frame/outline whereas food is regularly plated on round frame of the plate or bowl.¹¹ And such ‘subtle’ difference may have important implications as far as the way that the plating of food is read (cf. Arnheim, 1988). And then, there is the fact that patterns of visual fixation, even on paintings may be determined, at least in part, by whether the viewer believes themselves to be looking at a narrative painting or not (see Waligórska, 2006). One other question for future research concerns whether the diner is any more likely to remember the flavour of an aesthetically-plated dish. This is likely an important issue for future research to address, given the suggestion that it is our meal memories that may be at least as, if not more, important than the experience had while actually consuming a meal (see Spence, 2017a, in press b).

¹⁰ Though here it is worth noting, and has been noted previously (see Spence, 2017b), that when assessments of plating are conducted online, it is possible that the orientation in which a viewer rates a plate of food may be substantially closer to the vertical than is normally the case when food is plated on the table, and hence viewed at an oblique angle.

¹¹ Though this does raise the intriguing question of why plates are round in the first place? Perhaps it is an extension of the frame of the trencher plate – namely the stale rounds of bread that would, long ago (i.e., in the Middle Ages), have constituted the ‘edible’ plateware, before plateware itself was invented (see Spence & Piqueras-Fiszman, 2014, p. 155). Alternatively, there is a literature suggesting that round forms are liked more than angular forms, and hence serving from rounder plates might be expected to promote palatability (see also Gopnik, 2012). That said, when the food in the foreground has a strong form, the shape of the plateware may end up fading into the background (see Piqueras-Fiszman, Alcaide, Roura, & Spence, 2012).

Taken together, while the available evidence is currently somewhat limited, there do appear to be grounds for believing that diners (at least in the West) read the plate from left to right, but that any simple analogies about what that means for the positioning of the various elements on the plate (e.g., in order to convey the notion that a dish is healthy; cf. Romero & Biswas, 2016) is less than clear. The key point to note in closing though is that while details may vary, what all researchers do seem to agree on is that there are predictable patterns of visual inspection, and that by understanding these patterns, one can use such insights to better design experiences (i.e., to make them more intuitive/perceptually fluent; see Reber, 2012; Winkielman et al., 2015, on the notion of ‘processing fluency’).

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FIGURE LEGENDS

Figure 1. A plate of Risotto con Ossobuco all Milanese, as created by chef Roberto (Bobo) Cerea at the Carlton Hotel St. Moritz. The plating illustrates a dominant ascending to the right arrangement. [\[Photo courtesy of Stephan Floss, for Marmite Magazine.\]](#)

Figure 2. A) Typical scan-path as viewer inspects the painting entitled ‘The execution of Lady Jane Grey’. Is it possible that diners inspecting an aesthetically plated dish also exhibit any regularities in the way in which they ‘read’ the plate? B) Differing fixation patterns observed as a function of the different question asked of the viewer: How will the wedding turn out? (left) vs. random viewing (right). Would similar differences in scan-paths be observed if diners were asked different questions about a plate of food that had been placed before them (such as, for example, ‘How much would you pay for this dish?’ versus ‘How creative do you think the chef is?’)? [Figure reprinted with permission from Spinney, 2000; The New Scientist; see also <http://madameguillotine.co.uk/2013/02/12/the-execution-of-lady-jane-grey/>.]

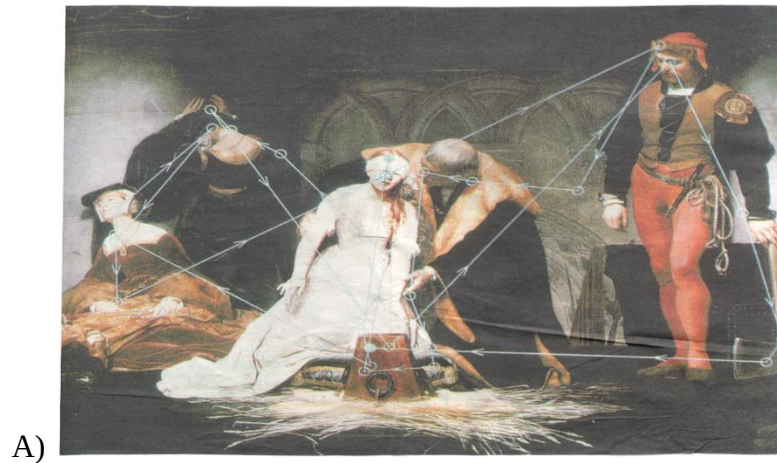
Figure 3. Diagram illustrating what is often reported to be the most common visual scan-path when it comes to reading a two-page restaurant menu. [Source: Yang (2012).]

Figure 4. Summary of the number of participants choosing between each pair of visual compositions of the food for the centred versus asymmetric compositions. Contrary to the general preference for a higher density of items on the right, these results do not show a preference for either left or right asymmetric plating. [Source: Velasco et al. (2016a).]

Figure 1.



Figure 2.



B)

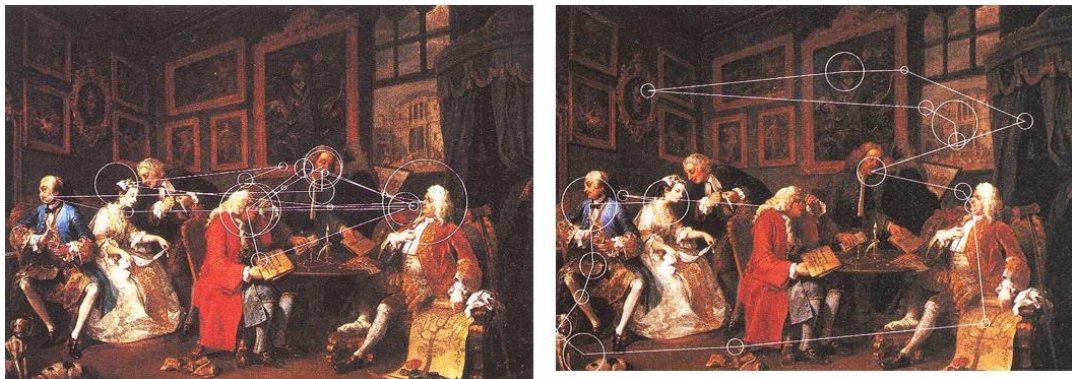
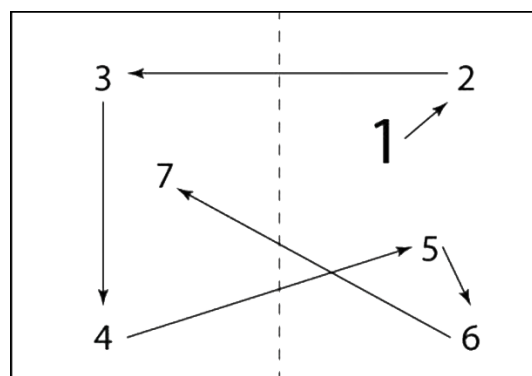


Figure 3.



659

660 Figure 4.

Stimuli	Frequencies	%
	1529	78.90%
	409	21.10%
	1525	79.34%
	397	20.66%

661