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## **From Odours to Flavours: Perceptual Organisation in the Chemical Senses**

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### **Abstract**

This chapter argues that smell and flavour perception present distinctive challenges for phenomenological reflection, but that these difficulties can be addressed through a ‘gestaltist’ approach to perceptual organisation. I argue that the ‘chemical’ senses do not generally allow immediate access to ordinary objects like roses and apples, but rather to *odours* and *flavours*, the diffuse nature of which make it hard to get a grip on the associated perceptual phenomenology. Drawing on the work of gestalt psychologists and phenomenologists, I outline a modality-neutral approach that emphasises the irreducibly *structured* nature of perceptual experience and is especially useful for thinking about experiences that are not targeted at ordinary physical objects. Such an approach can clarify and explain nebulous aspects of perceptual experience, illuminating elements of our smell and flavour experiences that may be indeterminate.

### **1 Introduction**

The phenomenology of smell and flavour perception is difficult to pin down. This is indicated both by extremely wide-ranging philosophical views about the phenomenal character of such perceptual experiences as well as the high levels of skill required in activities like wine tasting and perfumery. This chapter highlights that part of the reason for these difficulties is that these senses do not generally allow immediate access to ordinary objects like apples and roses, but rather to more diffuse worldly entities: odours and flavours. I argue that a ‘gestaltist’ approach to perceptual organisation can provide a methodology for working through these challenges. This is an approach advanced by gestalt psychologists and drawn upon by phenomenologists such as Gurwitsch and Merleau-Ponty, which emphasises the irreducibly *structured* nature of perceptual experience. Adopting such an approach shifts the emphasis away from ordinary three-

dimensional objects towards the way that aspects of the perceptual field are grouped together and segregated from their backgrounds. It offers an account of how we perceptually parcel up flavours and smells into unified and individuated gestalts, as well as accommodating and clarifying certain aspects of such experiences that are simply indeterminate.

This is how this chapter proceeds. Section 13.2 discusses the philosophical debate regarding *what* is immediately perceived via the chemical senses. Many have argued that the immediate objects of smell are *odours* rather than *source objects*—a position known as the ‘Odour View’. I argue that those endorsing this view ought, by parity of reasoning, to also endorse an analogous ‘Flavour View’: we immediately perceive flavours rather than ordinary objects. Section 13.3 presents a gestaltist approach to perceptual organisation, providing a modality-neutral methodology for exploring the nature of our perceptual experiences. This approach is especially useful in cases where the immediate target of our experiences is not—or is not usually—an ordinary physical object, but something more diffuse. The chapter closes in Section 13.4 with consideration of how gestalt organisation can help us think about indeterminacy in our flavour and smell experiences, for instance, highlighting situations in which there is no clear answer about whether one entity or multiple is being experienced.

## **2 What Do We Perceive through the Chemical Senses?**

### **2.1 The Odour View**

What do we perceive immediately through the sense of smell? We often talk as though we smell ordinary objects like roses, dustbins, and loaves of freshly baked bread. However, many philosophers of olfaction have argued that the sense of smell does not allow the immediate

perception of ordinary objects, but rather the perception of *odours* (e.g., Lycan, 1996; Batty, 2010b, 2011, 2014a, b; Richardson, 2013, 2018; Carvalho, 2014; Young, 2016). While there has been debate on this subject, here I take odours to be mixtures of volatile molecules released into the air by source objects like roses and dustbins. The idea that odours do not merely serve as causal intermediaries (like light in vision) but are themselves what we perceive through olfaction has been referred to as the ‘Odour View’ (e.g., Richardson, 2018).

Two main reasons for endorsing the Odour View have been outlined in the literature (e.g., Lycan, 1996; Batty, 2010b; Richardson, 2013; Young, 2016). First, olfaction is not sufficiently attuned to the presence and absence of objects like roses and rubbish bins, or to the way these objects change over time, to constitute a means of perceiving them. Richardson makes this point: ‘For example, cooking odours linger in the kitchen long after the food is eaten, and the sillage of your perfume is the scented wake you leave in the elevator after you’ve stepped out of it’ (2013, pp. 403–404). For this reason, she argues that olfaction is simply too insensitive to the comings and goings of source objects to allow for *perceptual* contact with them. Instead, the sense of smell only allows for *thought* contact with ordinary objects (i.e., in the form of cognitive attitudes, such as beliefs). Accordingly, we do not perceive the presence and absence of ordinary objects through the sense of smell. We do, however, perceive the presence and absence of, and changes to, *odours*.

Others cash out the argument about presence and absence in terms of the implausibility that olfactory experiences are *non-veridical* once the source of the odour has gone (e.g., Batty, 2010a; b; Young, 2016). Experiences of lingering smells are commonplace and taking ordinary objects

to be the immediate target of olfactory experiences gives rise to an ‘implausible amount of olfactory misperception’ (Batty, 2010a, p. 532, 2010b, p. 1150). Smells can remain once the source of the smell has been removed or destroyed, and these experiences of lingering odours appear not to be non-veridical.

A second argument advanced in favour of the Odour View is that odours can be produced artificially, and perception of these artificial odours is not automatically non-veridical (e.g., Lycan, 1996; Young, 2016). As Lycan states:

[T]here are objects other than roses that set off the rose smell—artificial rose smells can be made of any substance whose molecules are shaped similarly to those of roses. The point is not that the nose can be fooled. Au contraire; it is that in the artificial case, the nose is not fooled, and the rose smell is not incorrectly tokened. An artificial rose that produces the rose smell is smelled correctly, for it does have that smell even though it is not a rose.

(1996, p. 90)

In smelling the artificial rose smell, subjects are accurately perceiving something that is really there in their environment, that is, the rose odour. Taking it to be *odours* rather than source object that we immediately perceive best makes sense of olfactory accuracy conditions. Thus, most philosophers within this debate have taken it to be odours rather than ordinary objects that we immediately perceptually access through the sense of smell. Such an approach is compatible with the idea that we also *indirectly* perceive the source objects *through* perceiving the odours (see Lycan, 1996, 2014).

That the sense of smell seems to most immediately involve the perception of diffuse collections of molecules rather than ordinary objects such as roses and dustbins puts it in sharp contrast to vision. However, I shall now argue that olfaction is closely analogous with *flavour* perception in this regard and that those who are convinced by the two key arguments for the Odour View should be convinced by parallel arguments about flavour perception.

## 2.2 The Flavour View

Flavour perception involves gustatory, olfactory, tactile, somatosensory, and trigeminal sensation. I focus on *flavour* rather than *taste* (in its narrow, technical sense) because we rarely, if ever, experience the so-called basic tastes (sweet, salt, bitter, sour, umami) without them presenting simply as aspects of *flavours* (i.e., the sweet, sour, citrusy flavour of an orange) (see, e.g., Smith, 2013 for discussion). Flavour perception may seem more tightly wedded to everyday objects than the sense of smell: we lick and chew objects like ice lollies, boiled sweets, and grapes to taste them. Thus, ordinary objects may appear to be good candidates for what we immediately perceive through the sense of flavour. However, both key arguments for the Odour View can also be made with regard to flavour, giving rise to an analogous *Flavour View*.

As discussed, the two main candidates for *what* we perceive through smell are ordinary objects and odours. What do we perceive through the sense of flavour? One possibility is that we immediately perceive *everyday objects*—tomatoes, bananas, chocolate bars. Another possibility is that we most immediately perceive *flavours*. Smith (e.g., 2007, 2013, 2015a, 2020), provides a helpful account of the nature of flavours, telling us that, ‘We can characterize flavors as configurations of sapid, odorous, and tactile properties of the foods and drinks we consume,

some of which give rise to irritations of trigeminal nerve endings or vibrations of mechanoreceptors in the tongue...’ (2020, p. 46). For Smith, these configurations of properties are not constructions of the brain but objective aspects of the world to be discovered.

There are reasons to endorse the idea that we immediately perceive flavours rather than ordinary objects. First, akin to the argument regarding artificial odours, many flavours can be produced artificially. Just as smelling an artificial rose odour is not a non-veridical experience, tasting an artificial flavour isn’t non-veridical either. Isoamyl acetate is a compound that is found naturally in bananas. However, it is also produced synthetically and confers a banana-like flavour. If someone consumes isoamyl acetate and perceives a banana flavour, it doesn’t seem that they are having a non-veridical experience despite a lack of actual bananas. Rather, the subject would seem to be accurately perceiving a banana *flavour*. Cases such as meat and dairy replacement products could also be good examples of the artificial recreation of certain flavours, especially as these products generally attempt to imitate tactile and textural components of the relevant flavours too, rather than just the gustatory and olfactory elements. If a veggie burger accurately replicates the taste of beef, the taster isn’t wrong to perceive a beef-like flavour, even if the burger is actually made from soy protein. The manufacturers have likely gone to great lengths to replicate a specific flavour.<sup>1</sup>

Secondly, there are parallels to the argument regarding odours persisting in the absence of a source object. Flavours too can persist in the absence of an ordinary object. Consider, for example, after-tastes. After tasting something unpleasant, the flavour can linger long after the food has already been swallowed. Just as in the olfactory case, the taster’s perception is not non-

veridical just because the offending food item has already gone. More generally, much of the perception of flavour occurs after swallowing, when volatile molecules are released into the throat and reach the olfactory epithelium retronasally. Paralleling the orthonasal olfactory case, these volatile chemicals are separate from the everyday objects that give rise to them. Volatile molecules are not ordinary objects like bananas and chocolates, and they are no longer detectable through other senses like vision or touch. If such an argument shows that odours, and not source objects, are what we immediately perceive through the sense of smell, the same reasoning ought to be extended to flavour perception.

Therefore, advocates of the Odour View should conclude that everyday objects like bananas and chocolate bars are not what we immediately perceive through the activity of tasting. Flavours can continue to unfold over time, even as the everyday object is transformed and/or swallowed. Also analogous to the olfactory case, to say we most immediately perceive flavours rather than ordinary objects is not to say that we couldn't also, more indirectly perceive foods and beverages *through* the act of perceiving flavours (as per Lycan's, 1996 approach to olfaction). A 'layered' approach to perceptual representation is compatible with the Flavour View, just as it is with the Odour View.

Before moving on it is worth noting an important limitation regarding the scope of the arguments above. According to Solveig Aasen (2019), the arguments for the Odour View only show that we don't *always* immediately perceive ordinary objects through the sense of smell. She points out that consideration of artificial odours and our poor abilities to track the presence and absence of source objects only suggests that *those* cases of smelling are not targeted at ordinary source

objects. We need not assume that olfactory experiences have the same type of object in all cases, so it remains a possibility that we *sometimes* immediately perceive source objects, while perceiving odours at other times. This limitation seems even more pertinent in the case of flavour. Though *sometimes* flavours persist long beyond the existence of the source of the flavour, at other times our experiences do closely track the presence and absence of ordinary objects. When one licks an ice lolly, there is immediate contact with the physical ice lolly. It is widely accepted that tactile stimulation is a common constituent of flavour perception (whereas it is controversial whether tactile stimulation can be considered a constituent of smell perception)<sup>2</sup> and the tactile elements of flavour are often closely wedded to physical objects. Thus, the scope of the arguments of the previous sections should not be overstated. Nevertheless, it seems that, at least *much* of the time, experiences of flavour and smell are not immediately directed at ordinary objects.

### **2.3 Phenomenological Challenges**

People are often bad at reflecting upon their perceptual experiences. For instance, in the visual case, phenomena such as inattentive blindness highlight that our experiences of the world are not as high-fidelity or richly detailed as one might believe. Providing subjects with an attention-intensive task can cause them not to notice events that we may expect to be very conspicuous, such as a person in a gorilla suit walking through a basketball game (Simons & Chabris, 1999).<sup>3</sup> Nonetheless, when subjects do—after prompting—visually focus in on a previously unattended detail like the gorilla, there is generally a concrete object to be found. Things are not so clear-cut in the case of the chemical senses. This section argues that the nature of the entities perceived through flavour and smell (i.e., diffuse odours and flavours) presents additional challenges for



phenomenological reflection that go beyond mere worries about the unreliability of naïve introspection.

Let us begin by considering the diversity of philosophical accounts of flavour and smell experiences, which seem indicative of difficulties in specifying their phenomenological features. Olfactory experience has been variously taken to present us with nebulous sensations or features, with ‘existentially-quantified’ objects as per Batty’s ‘abstract’ account (2010a, 2011), and with perceptual objects exhibiting figure-ground segregation (Carvalho, 2014; Millar, 2019), which may be experienced against the backdrop of other odours in the form of ‘smellscapes’ (Young, 2020). Such accounts range between taking the smell’s phenomenology to involve nothing more than a quale ‘lingering uselessly in the mind without representing anything’ (Lycan, 1996, p. 90) to accounts according to which we have rich experiences of structured wholes. Some adopt positions according to which we don’t experience individuated *particulars*, through the sense of smell but we still perceive something-or-other ‘here’, which instantiates olfactory properties (Batty, 2010a). These debates hinge partly upon whether olfaction allows for figure-ground segregation—the experience of a unified *figure* distinguished from the rest of the perceptual landscape—with researchers using this criterion to argue both for (e.g., Wilson & Stevenson, 2007; Carvalho, 2014; Millar, 2019) and against (e.g., Batty, 2011, 2014b; Keller, 2016, Chap. 3) the idea that we experience discrete olfactory particulars. There is also controversy about the extent to which we experience spatial content. Some argue that the sense of smell is aspatial or that odours are undifferentiated spatially (e.g., Lycan, 2000; Wilson & Stevenson, 2006; Matthen, 2005; Batty, 2011, 2014b; Carvalho, 2014), while others argue that even if olfaction is unlike vision in terms of its spatial character, we do experience odours spatially (e.g., Young,

2016; Millar, 2019; Aasen, 2019; Smith, 2019). Others have presented detailed critiques of the notion of olfactory objecthood (e.g., Barwich, 2019), rejecting claims that odour experiences exhibit the hallmarks of objecthood.

Flavour perception has received comparatively less attention than smell in debates about objecthood. However, there is still controversy about this form of perception. As Smith (2007) outlines, many take tasting to be a purely subjective experience, rather than something that puts you in contact with objective aspects of the world. Relatedly, it has been held by some that neither chemical sense is truly *perceptual*. For example, Burge (2010) argues that these senses do not exhibit perceptual constancies, and thus, they do not allow for perceptual experience at all but rather only allow for proximal sensation.<sup>4</sup> Elsewhere, it has been argued that flavour perception doesn't involve figure-ground segregation (Stevenson, 2014, p. 1373), and, as in the case of smell, there is an open question about whether it allows only for the perception of properties or features, or whether it allows for the experience of more complex structured wholes. More broadly, flavours are tricky to characterise and describe, as exemplified, for example, by the challenging nature of wine-tasting (Smith, 2015b).

There are many reasons it is challenging to offer accounts of the phenomenology of flavour and smell experiences. For instance, it is well known that it is hard to describe olfactory experiences in Western languages like English and Dutch, in that we lack a dedicated lexicon for talking about smells. People typically refer to the source of the odour, rather than using abstract terminology to describe the odour itself (e.g., see Majid et al., 2018). Another challenge for those trying to characterise perceptual phenomenology is that, in the case of olfaction, this

characterisation depends partly upon how liberal a conception of the sense of smell one is willing to endorse. This issue arises in terms of whether *trigeminal* and *tactile* stimulation caused by the inhalation of odours, which allow for richer directional content (e.g., Kobal, et al., 1989), can be considered components of *smell* experiences. It also arises with regard to whether one allows for temporally protracted diachronic engagement with the environment in assessing the content of smell (e.g., Millar, 2019; Aasen, 2019) or instead focuses on synchronic cases of smell experiences at-a-time, where the subject doesn't move around (e.g., Lycan, 2000; Batty, 2010a). More liberal conceptions generally allow for smell involving a richer spatial character and can more easily facilitate a characterisation of odour experiences as involving *figure-ground* segregation. Related worries occur in the case of flavour perception too: whether we include orthonasal olfaction, or even auditory and visual aspects of the experiences of eating and drinking, as aspects of *flavour* alters how we would have to characterise the experience. Putting aside worries about limited lexicon and how to individuate the senses for current purposes, however, a further distinctive challenge arises in relation to what the chemical senses allow us to perceive. An important reason for the phenomenology of smell and flavour being difficult to grasp, is, I argue, that they involve the perception of more diffuse worldly entities than are perceived in the visual case.

It is not too difficult to reflect upon the ways in which we visually experience aspects of the environment as grouped into *single* objects, distinct from other perceived objects around them. The chair is perceived as a figure against the background of the rest of the office, for example. While someone might focus their attention on the discoloured patch on the chair leg instead of the whole chair, and experience this patch temporarily as a figure, this is less common and more

difficult to sustain than experiencing the whole chair as a figure. Most often, visual experiences involve the segregation of figures from backgrounds in a way that maps onto our understanding of the boundaries between such tables, chairs, and other ordinary objects. Therefore, *perceptual objects* in vision usually correspond to ordinary, physical objects (with some exceptions, like rainbows and holes; see O’Callaghan, 2016). We see tomatoes, apples and roses, and the visually perceived boundaries of these objects are specified by the boundaries or edges of these physical entities. We have a fairly clear pre-philosophical understanding of the divisions between physical objects, and by the same token, we arrive at a (rough and ready) understanding of the structure of visual perception with relative ease. The world is generally visually carved up, more or less, in accordance with the divisions between ordinary objects.

The chemical senses, on the other hand, do not perceptually organise the world in accordance with the divisions between ordinary physical objects. They allow us to (at least often, in the first instance) experience odours and flavours, not roses and tomatoes. People generally don’t have well-established pre-philosophical intuitions about the divisions between these kinds of entities. Arguably, flavour perception is even more challenging than smell in this regard, since we perhaps have a clearer sense of what would constitute a singular *odour* (e.g., a single molecular cloud) than we have about what would constitute a singular *flavour*. Such difficulties make the perceptual organisation of these experiences less *prima facie* apparent than in the case of vision. This helps explain the lack of consensus among researchers about whether the chemical senses even meet the criteria for *perception* (e.g., Burge, 2010 argues that they do not), and if they do allow for perception, whether they allow the perception of discrete particulars. Flavour and smell thus present unique phenomenological challenges.

The gestaltist approach to be outlined offers a way of thinking about perceptual organisation without needing an answer about whether a given collection of volatile molecules or configuration of flavoursome properties, ought to count as one entity or multiple; the emphasis is on whether we perceive bits of the environment as unified, discrete entities, rather than what is an object in some independent metaphysical sense. It thereby provides a framework for thinking about types of perception that don't map neatly onto three-dimensional physical objects.<sup>5</sup> As we shall see, sometimes it is clear-cut whether one's smell or flavour experience is as of a singular unified whole, and gestalt psychology offers an account of the conditions under which this occurs, that is, where such an organisation is maximally 'prägnant'. However, at other times there is no such determinate answer, and again, the gestaltist approach can tell us why this is so.

### **3 Perceptual Organisation**

#### **3.1 The Gestaltist Approach**

The gestaltist approach tells us that perceptual experience is irreducibly *structured*—a key insight adopted and developed by phenomenologists such as Gurwitsch (1964/2010) and Merleau-Ponty (1945/2012; see also Isaac & Ward, 2021 for discussion of the commonalities and conflicts between phenomenological and gestaltist approaches).<sup>6</sup> Gestalt psychologists like Koffka, Köhler, and Wertheimer held that experience isn't stitched together from an assortment of discrete, piecemeal sensations, but instead has a holistic character. The perceptual landscape is segregated into unified entities, and the contribution of the parts that make up these entities cannot be treated independently from the significance of the *whole*. Perception is thereby taken to be irreducibly structured and organised. With this approach, we can think about perception in

terms of perceptual grouping and segregation, and perceptual groupings may or may not map onto ordinary physical particulars like tables and chairs. An advantage of focusing on perceptual grouping and segregation—that is, the *structure* of perceptual experience—is that it shifts the emphasis away from ordinary physical objects towards *perceptual objects*. This approach offers a way of characterising perceptual phenomenology that is *modality-neutral* in that these principles of perceptual organisation are held to apply across the senses, capturing commonalities that hold between them, rather than emphasising, say, the different objects or properties accessible to the senses. This approach provides tools to understand why we are especially likely to perceptually group together certain aspects of the environment.

Figure-ground segregation is a central aspect of the way the perceptual field is organised.

Whenever we visually perceive objects like apples, tables, and chairs, it's hard to conceive of how these items could be experienced without them being against some kind of background. The table is seen against the background of an office, the apple against the background of the table, the chair against the background of the bookshelf. The background is experienced as more homogenous, less determinate, and 'behind' the figure. That experience is organised in this way has been taken by some to be a basic fact about perception. Phenomenologist and gestalt theorist Gurwitsch tells us, 'The "figure-ground-structure" is exhibited by all perceptual phenomena, starting from the simplest possible case of a uniformly colored spot appearing on a homogeneous background' (1964/2010, p. 109). Drawing upon such ideas, Merleau-Ponty likewise says, 'The perceptual "something" is always in the middle of something else, it always forms part of a "field"' (Merleau-Ponty, 1945/2012, p. 4).

Taking perceptual experience to by necessity exhibit a figure-ground structure is a strong claim and appears (at least *prima facie*) to be challenged by instances where we visually perceive a homogenous wall or sky, for example, where there isn't obvious segregation of figure from ground. However, even if one denies that figure-ground segregation is necessary for perceptual experience, a weaker claim is often made that figure-ground segregation is a central hallmark of *perceptual objects*: perceptually experienced *individuals* that instantiate properties.<sup>7</sup> Perceptual objects are often taken to involve figure-ground segregation because this captures the perception of them as *discrete* and separate from everything else in the perceptual field. Perceptual objecthood involves perceiving something *as* an object, rather than perceiving something that so happens to be an object. For example, if you hold a large blank sheet of paper in front of your face so it fills the entire visual field, the sheet of paper may be an object that you happen to be looking at, but it isn't experienced as an object in the sense of allowing for the immediate perceptual experience of the paper's boundaries or segregation from other objects.

The flip side of figure-ground segregation is perceptual grouping. The gestalt psychologists (e.g., Wertheimer, 1923/1938; Metzger, 1936/2006) set out various perceptual grouping principles, thought to describe the circumstances under which aspects of the environment will (*ceteris paribus*) be perceptually grouped together or segregated. For parts of the environment to be meaningfully grouped into a single, bounded figure, they must also be perceived as distinct from their backgrounds; being grouped into a *single* object implies a separation from whatever else is around them. As argued elsewhere (Millar, 2019), perceptual grouping and segregation alone may not be *sufficient* for perceptual objecthood but do seem to be *necessary* for perceptual objecthood.

The most fundamental grouping principle is the law of 'Prägnanz', or good form, which states that percepts are organised in the most orderly, simple, and harmonious way possible. Koffka (1935, p. 110) states, 'psychological organization will always be as "good" as the prevailing conditions allow'. The definition of 'Prägnanz' was left intentionally vague by gestalt psychologists, with Wertheimer appealing to readers' intuitions about the concept:

On the whole the reader should find no difficulty in seeing what is meant here. In designing a pattern, for example, one has a feeling how successive parts should follow one another; one knows what a "good" continuation is, how "inner coherence" is to be achieved, etc.; one recognizes a resultant "good Gestalt" simply by its own "inner necessity"...

(1923/1938, section VII)

Other more specific grouping principles include the principles of similarity, proximity, and common fate, which say that we are more likely to group elements that are similar, proximate, and follow a common trajectory, respectively.<sup>8</sup> These other grouping principles are subsumed by the overarching principle of Prägnanz, specifying elements of what it means for perceptual organisation to be prägnant (e.g., similar and proximal elements should be grouped together, while dissimilar and non-proximal elements should not be). Each grouping principle is defeasible if other principles allow a more prägnant gestalt to emerge.

The grouping principles have mainly been explored in relation to vision, but there has been discussion of their application to audition (e.g., Wertheimer, 1923/1938; Metzger 1936/2006, p.



27; Bregman, 1990) and, to a more limited extent, touch (e.g., Metzger, 1936/2006, Ch. 4).

While in vision these principles generally apply in a spatial manner, in audition, sound streams are more likely to be grouped on the basis of their *temporal* structure, timbre, frequency, and volume (e.g., McAdams & Bregman, 1979; Bregman, 1990). There remains comparatively little discussion, however, of the application of these principles to the chemical senses.

### **3.2 The Perceptual Structure of Smell and Flavour**

This section discusses perceptual organisation in smell and flavour, considering the role of gestalt principles and figure-ground segregation. As noted, whether olfaction allows for a figure-ground structure has been the subject of considerable debate, while flavour has received comparatively little attention in this regard (though, see discussions in Stevenson, 2014, p. 1373; Spence & Youssef, 2016; Roque, et al., 2018, pp. 4–5). Nevertheless, many take flavour perception to involve an experience of *unified* percepts (e.g., Delwiche, 2004; Small & Green, 2011, Section 36.1; Auvray & Spence, 2008, p. 1027 to name just a few such researchers), which is suggestive of structured perceptual experiences as of wholes or gestalts. Here, I will not discuss whether the gestalt-like nature of a flavour experience suffices for *perceptual object* status. However, it at least provides an initial impetus for characterising flavour experiences in such terms and motivates consideration of how principles of grouping and segregation may apply, enabling an analogy with perceptual organisation across the other senses.

The gestalt grouping principles can inform us about why certain mixtures of volatile molecules or sapid and odorous properties are likely to be experienced as unified (e.g., a singular coffee odour) while others are experienced as clearly distinct from one another (e.g., a coffee odour contrasting with air freshener). Elsewhere, I have argued that the sense of smell coheres with

various grouping principles, providing evidence that the sense of smell allows for the experience of structured wholes that instantiate properties (Millar, 2019). When one smells a coffee odour, although there may be notes of cacao and raspberries, for example, the different elements of the odour are generally sufficiently similar, and unfold over time in a cohesive manner, allowing the odour to be experienced as of a unified whole. Some odours are more complex but may still be experienced as a structured whole. For instance, perfumers aim to produce perfumes that are balanced and harmonious, allowing for a unified experience of the top, middle, and base notes. When all goes well, the different notes lose their individual identities and are experienced as part of a structured whole, cohering with the principle of *Prägnanz*.

In terms of more specific principles, *similar* smelling components are more likely to be perceived as unified, while dissimilar components are more easily individuated from one another (see Wiltrout, et al., 2003; Young, 2016). Common fate may also play a role here: where different aspects of odours unfold in synchrony over time, they are more likely to be experienced as grouped. Olfactory grouping and segregation can seemingly also occur in a *spatial* manner if we conceive of the sense of smell as involving protracted bodily engagement and tactile stimulation, enabling a potential role for spatial variants of the principles of proximity and common fate. For example, Porter et al. (2007) have studied human abilities to track odour trails, asking participants to follow a trail of chocolate essential oil while wearing a blindfold and sound-blocking earmuffs, and finding that people could do this very competently. In this case, there seems to be a kind of spatial discrimination where one closely follows the contours of the path of chocolate.

Importantly, however, the claim is not that a specific collection of volatile molecules (e.g., those given off by a particular perfume) will always be experienced as a structured whole. In some environments, such as a perfume counter where there are multiple perfume odours in the air, the ‘smellscapes’ might prompt a different perceptual organisation (e.g., the base notes of two different perfumes might be perceptually combined, while their top notes are likewise combined) if the similarity of these components makes this the most prägnant interpretation of olfactory scene.<sup>9</sup> The gestalt principles provide tools for understanding why, in some perceptual environments like the perfume counter, we may not group things in the same way we would elsewhere.<sup>10</sup>

How about flavour perception? There is certainly an intuitive sense in which the principle of Prägnanz applies. Foods and beverages can be composed in more or less harmonious ways, which impacts the extent to which we have a cohesive flavour experience. In a well-balanced wine, the tannins, acidity, sweetness, and alcohol are all incorporated in such a way that no one component stands out. The harmonious organisation of these elements allows for a more unified flavour, suggesting that flavour perception is guided by an analogous overarching principle to the other senses. Others have relatedly observed that the final flavour(s) produced in a recipe differs from the mere aggregation of the flavours of the ingredients; the whole differs from the sum of the parts, which has also been taken to be indicative of a unified *gestalt* rather than a selection of mere disjointed properties (Pomerantz & Cragin, 2015).

Specific grouping principles (subsumed by the overarching principle of Prägnanz) such as the principles of similarity, common fate, and proximity plausibly also play a role here. The

principle of similarity states that elements tend to be grouped together if they are similar to each other. Where we are less able to tell different flavour properties apart, we're more likely to experience them as grouped, and where they are dissimilar, they are more likely to be perceived as separate flavours. Consider the experience of eating a salt and vinegar crisp at the same time as eating vanilla ice cream. This is—I think—likely to result in an experience as of two distinct property-instantiating flavours, largely because of their pronounced dissimilarity in terms of the whole range of flavour properties involved (gustatory, olfactory, tactile, and thermal). The property of sweetness is unlikely to be grouped in with, or attributed to, the vinegary, crunchy crisp flavour, but rather to the cold, soft ice-cream flavour.

Moreover, in such a case, especially where there is a jarring conflict between flavour profiles, the perceiver is also likely to focus their attention in on one of the two flavours at a time, relegating the other to *background*. Consideration of such cases is suggestive of a figure-ground structure. As in vision, we can shift our attention, altering what counts as figure and what counts as background, and the 'background' lacks the fidelity of, and is less determinate than, the attended figure. A particular flavour (including its varied properties, such as saltiness, sourness, crispiness) can pop out in experience, while other things tasted become less salient and determinate.<sup>11</sup> Other principles (such as temporal analogues of proximity and common fate) may also be in operation. For instance, if the sweet vanilla taste follows a very different temporal trajectory to the vinegary taste of the crisp, perhaps fading away more quickly, this will likely also influence whether these different flavour components are experienced as unified. This can be conceived of in terms of the principle of 'common fate', where elements changing in accordance with one another over time are more likely to be grouped.

If grouping principles are in operation here, however, what ought we to say of the fact that *contrasting* (non-similar) flavour elements often seem pleasantly harmonious? I believe that the right thing for the gestaltist to say here is that, regardless of whether we enjoy certain contrasts between flavour elements, we are still *more likely* (*ceteris paribus*) to experience such elements as distinct flavours than we are when tasting similar flavour elements. One might enjoy the contrast between bitter dark chocolate chips and sweet creamy vanilla in an ice-cream, but this contrast does seem to pull the two flavour elements phenomenologically further apart than, say, chocolate ice-cream with chocolate chips. This is, of course, not to say that such elements *cannot* be experienced as aspects of the very same unified flavour if that remains the most *prägnant* organisation of the perceptual landscape. Other principles may be in operation that collectively make this so. For example, it may be that such flavour elements evolve in synchronous ways over time, in accordance with the law of common fate, and they occur in a spatially and/or temporally proximate manner.

There is much more to be said about perceptual structure in these modalities, but this section has set out some initial reasons to believe that gestalt principles guide flavour and smell perception, much as they do in the case of the other senses.<sup>12</sup>

#### **4 Indeterminacy in Flavour and Smell Experience**

We have seen that the gestaltist approach can provide some principled methods for characterising perceptual phenomenology. Its focus on grouping and segregation is especially helpful where the perception is not most immediately directed at ordinary objects. In closing this

chapter, it is worth highlighting that the gestaltist framework can also accommodate the possibility that certain aspects of perceptual experiences are indeterminate.

Some smell and flavour experiences are relatively clear in terms of perceptual organisation. Where there is sufficient similarity, temporal or spatial proximity, and overall harmonious connection between different sensory elements we should expect grouping, and where these elements are dissimilar, non-proximal, and non-harmonious, we can expect clear segregation (imagine a chocolate odour popping out against the backdrop of freshly cut grass). In some cases, like the perfume counter example discussed above, perceptual grouping and segregation may be atypical if that allows for the most prägnant organisation of a scene. A final consideration is that, sometimes, there may not be one singular optimally prägnant organisation of the scene; there may be multiple equally prägnant interpretations. The gestaltist approach can thus capture the possibility that sometimes it is simply indeterminate whether we are experiencing two separated perceptual objects, or just one perceptual object with different properties. In some cases, it might be unclear whether there is a unified perceptual object at all, or whether the experience is more akin to a kind of mere experiential prominence of certain features (as Batty, 2014a, b describes, for example).

All of the senses can give rise to experiences where it isn't clear how to perceptually divide up a scene (e.g., in bistable images like 'Rubin's vase', which can equally been seen as a vase or two faces). However, beyond such cases of bistability, perception usually does allow us to have a determinate experience of some worldly entity, even if this requires temporally extended investigation of the object. A shadowy figure seen in the dark, which you can't quite interpret,

turns out to be a potted plant upon closer inspection, for example. However, it may be that ambiguity persists more often in the case of flavour and smell, mapping on to the more diffuse nature of the aspects of the environment perceived through these senses. One might experience a mocha as involving distinct chocolate and coffee odours or flavours, or instead as involving a singular unified gestalt flavour or odour, and there may not always be an answer as to which interpretation is ‘best’.

This chapter has argued that those convinced by the claim that we immediately perceive *odours* through the sense of smell should also be convinced that we most immediately experience *flavours*—configurations of sapid, odorous, and tactile properties—through flavour perception. Establishing that (at least often) we do not immediately perceive ordinary objects through the chemical senses provides one reason for the difficulty in pinning down the associated phenomenology. As we have seen, a helpful route for characterising perceptual experience in these senses is to adopt a gestaltist approach to perceptual organisation, emphasising the grouping and segregation of aspects of the perceptual landscape rather than concrete objects.

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<sup>1</sup> For instance, the plant-based ‘Impossible Burger’ aims to replicate the consistency of real meat and even simulate its ‘bloodiness’, as discussed in the following (2017) article in *Wired Magazine*: <https://www.wired.com/story/the-impossible-burger/>

<sup>2</sup> For discussion, see Richardson (2013), Roberts (2016), and Millar (2019).

<sup>3</sup> Elsewhere, I argue that the chemical senses are analogous to vision in terms of giving rise to experiences that *outstrip* immediate sensory awareness (Millar, 2019, 2020).

<sup>4</sup> See Carvalho (2014) for arguments against Burge.

<sup>5</sup> See also Van Valkenburg and Kubovy (2004), who argue that focusing on perceptual organisation offers a modality-neutral way to bridge rifts in different theoretical approaches.

<sup>6</sup> Some aspects of the gestaltist approach are disregarded in the phenomenological literature, and will also not be discussed here, such as claims of psychophysical isomorphism.

<sup>7</sup> Perceptual objects are distinguished from both *intentional objects*—those things our intentional states are directed at—and *ordinary objects* (see O’Callaghan, 2008). The notion of perceptual objecthood is concerned with how we perceive aspects of the world as parcelled up into discrete, property-bearing entities.

<sup>8</sup> Although beyond the scope of this discussion, there may be a role for learning and past experience in the operation of gestalt principles. Wertheimer, for example, suggests that *familiarity* can act as another defeasible cue in perceptual grouping (e.g., 1923/1938, p. 160). This allows the possibility that what counts as an optimally prägnant organisation can differ depending upon prior experience.

<sup>9</sup> I thank Andreas Keller and Ben Young for highlighting this possibility, which prompted clarification of my arguments.

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<sup>10</sup> Here I only discuss grouping and segregation as *necessary*, rather than sufficient, for perceptual objects, so there may be further constraints upon whether these atypical perceptual groupings of volatile molecules reach ‘perceptual object’ status. For instance, in Millar (2019), I take perceptual constancies to also be necessary.

<sup>11</sup> Stevenson (2014, p. 1373) argues flavour perception doesn’t allow for figure-ground segregation because, particularly when eating a singular food item at a time, there is no suitable *background* against which the flavour is experienced. However, figure-ground segregation is, in other sense modalities, generally taken to allow for an experience of a figure against some kind of *absence*. For example, *silences* can serve as a background in audition, with Gurwitsch (1964/2010) asserting that auditory stillness is ‘the experience of an auditory background *par excellence* out of which sounds emerge and into which they relapse’ (p. 109). By analogy, I do not see why a *clear palate* cannot serve as a background in the flavour case.

<sup>12</sup> An analogy with how such principles operate in audition (rather than vision) is especially apt since sound-streams, much like flavours and smells, unfold dynamically over time (e.g., see Bregman, 1990).