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Neurophenomenal structuralism as a general theory of consciousness?

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Abstract

While *neurophenomenal structuralism* (NPS) is typically viewed as an account of why an experience, i.e. a conscious mental state, has a specific phenomenal character, Sascha Fink has suggested that NPS might also account for why one has an experience in the first place. According to Fink, the character-determining structures are incorporated in larger (meta-)structures that make the incorporated structures conscious, while also contributing their own Gestalt-related phenomenology. We examine the commitments of such generalized 'NPS+', formulating three challenges for Fink's approach. According to the *unconsciously perceived gist objection*, there is evidence for *unconscious* Gestalten, which suggests that the Gestalt-forming mechanism fails to make the relevant mental state conscious. Moreover, the existence of *Ganzfeld* experiences suggests that some experiences lack Gestalt-structures. Thirdly, as we explain, proponents of one-factor NPS+ face the *mirroring dilemma* of having to choose between a vicious regress of incorporating structures, and compromising their theory's methodological promise. We then formulate two challenges for *any* two-factor form of NPS+: The *more of the same challenge* concerns the question of why adding more structures to content-related structural features makes these features conscious, while the *structure-selection challenge* concerns the question of why some neural structures, but not others, are selected for consciousness.

Keywords: General correlate of perceptual consciousness • NCC • Neurophenomenal structuralism • Perceptual content • Phenomenal consciousness

According to the hypothesis of neurophenomenal structuralism (Fink & Kob, 2023; Fink et al., 2021; Kob, 2023; Lyre, 2022), the structural features of conscious experiences closely mirror the structure of activations in the neural basis of these experiences. This *mirroring claim* is, according to NPS, methodologically significant in allowing us to place a constraint on which neural events qualify as genuine *neural correlates of consciousness* (NCCs). While various neural events correlate reliably with a particular type of experience, not all of them are proper substrates, or NCCs, of this experience. Indeed, some of these events may be merely co-occurrent with a type of conscious experience, lacking any deeper connection to it (see Fink, 2024). In other cases, however, the relation between a neural state and a type of experience hints at a stronger tie between the two, which would mean that the neural state is an *NCC proper*, as opposed to being a mere inessential neural accompaniment, hence a mere *statistical NCC* (see Fink et al., 2021). According to NPS, what distinguishes NCCs proper from mere statistical NCCs is close structural similarity, or even *isomorphism*, between the experience in question, and the candidate NCC – only if this *structural similarity constraint* (Fink et al., 2021), a methodological counterpart of the mirroring claim, is met, can a candidate NCC be considered an NCC proper.

In addition to the *mirroring claim*, proponents of NPS make the *individuation claim*, according to which structural features of experience *fully individuate* the experience in question by determining, or capturing its phenomenal character, i.e. what it's like for a subject to undergo the experience. The experience of tasting an espresso, for example, has its specific, bitter-ish phenomenal character solely due to its *structural, or relational, features*, proponents of NPS tell us. Here structural features of experience-type *E* amount, roughly, to a set of relations of (phenomenal) similarity and difference that *E* stands in with respect to other experience-types. NPS thus rejects the idea that phenomenal character of an experience is a matter of the experience's *intrinsic* properties, i.e. of the nature of the experience considered on its own (Lyre, 2022).[1]

[1] In what follows, we will – unless specified otherwise – follow proponents of NPS in using the terms 'structure' and 'structural features' in this *relational* and *holistic* sense.

One pressing question about NPS concerns the scope of this theoretical proposal. In particular, proponents of NPS disagree on whether their theory is to be taken merely as an account of the *specific* phenomenal character each experience exhibits, or whether it could be a *general* theory of consciousness which must, in addition, explain why the resulting state is conscious. Here most NPS theorists (e.g., Kob, 2023; Lau et al., 2022; Lyre, 2022) endorse the weaker claim that NPS is best understood as a theory of phenomenal character. According to these thinkers, then, NPS does not address the question of why a specific phenomenal character is conscious, or why one has an experience at all, which they take to be a separate issue. Fink [in Fink and Kob (2023); henceforward abbreviated as FK], however, goes a step farther. He proposes that NPS can become a general theory of consciousness since it's capable of answering what he calls the *criterion question* of what makes a mental state conscious, as well as the *individuation question* of what makes a mental state feel *this* particular way, instantiating a particular phenomenal character (FK, pp. 122–124). Such a *general* NPS would be an original and potentially ground-breaking addition to consciousness studies, which makes Fink's proposal well worth scrutiny.

While we have some sympathy for NPS's methodological recommendations (see Kob, 2023), we don't share Fink's optimism about NPS being able to provide a general account of consciousness. Indeed, after specifying the commitments of such a general form of structuralism in sections (1) and (2), we argue, in section (3), that Fink's proposal falls short of being a plausible general account of consciousness. After that, in sections (4) and (5), we address the question of whether some structuralist account along the lines of NPS could provide a general theory of consciousness. We explain that any such account would face two serious challenges, which we label the *more of the same challenge*, and the *structure-selection challenge*. While the former challenge has to do with specifying the structural features responsible for one's mental contents entering consciousness, the latter challenge has to do with specifying why only some neural structures associated with mental contents enter consciousness while others remain unconscious. We draw some conclusions in section (6).

1 One-factor and two-factor theories of consciousness

To address the question of whether NPS could serve as a general theory of consciousness, it will help to invoke the distinction between *one-factor* and *two-factor* theories of consciousness. To approach this distinction, recall the Quality Space Theory (henceforth simply QST), defended by Rosenthal (2015), Lau et al. (2022), and others. While QST may differ from NPS in its emphasis and details, it is a close ally of NPS in identifying what Rosenthal calls 'mental qualities', i.e. the qualitative contents we encounter in consciousness, in terms of their *perceptual roles*, by the purely structural-relational properties of perceptual identities and differences. According to QST, a quality gains its identity due to its relative place in a systematically ordered quality space of all sensory qualities pertaining to a particular sensory modality (visual, auditory, etc.), or even across modalities (Lau et al., 2022). Very roughly, experienced orange colour looks the way it does due to being pretty similar to experienced redness, and yellowness, while being very dissimilar to blueness. More precisely, these similarities and differences are grounded in one's perceptual discriminatory abilities, which work along several dimensions, giving rise to a multi-dimensional quality space. This quality space for each individual is thus established empirically, via methods of perceptual psychophysics (Keller, 2016).

Crucially, Rosenthal's structuralist approach, which NPS builds upon, enables one to treat mental qualities *independently* of one's consciousness of them. The QST takes care of the qualities, but one still needs an account of how the qualities enter consciousness. In Rosenthal's case, this is the well-known HOT theory in which a higher-order state, a thought with a suitable content, targets a first-order state, such as a mental quality, thereby making it conscious (Rosenthal, 2005). In allowing for this sort of *division of theoretical labour*, where one theory accounts for mental qualities, while a different theory accounts for one's consciousness of these, Rosenthal's approach is an example of a *two-factor view*, analysing consciousness into two distinct factors that allow for separate theoretical treatments. As we'll put things, proponents of a two-factor view must, firstly, account for why an experience E has its specific *phenomenal character*, or phenomenal feel (i.e. why the experience feels reddish and not sweet-ish, for example), and, secondly, they must provide a separate account of why the experience is *conscious* in the first place (i.e. why it is an experience, and not merely an unconscious mental state). In Rosenthal's case, the QST is an attempt at the former account, while his HOT theory is an attempt at the latter account.

In dividing the daunting task of accounting for consciousness into two (seemingly) more manageable tasks, two-factor views (see, e.g., Coleman, 2015, 2025; Marvan & Polák, 2017; Rosenthal, 2005, 2015) hold a *prima facie* methodological advantage over *one-factor views*, i.e. theories that attempt to account for consciousness in one fell swoop, invoking a single (neural) mechanism to account for both the specific phenomenal character and the fact that the character enters consciousness. Examples of one-factor theories include first-order representationalism (e.g., Tye, 2000), or the integrated information theory (e.g., Tononi et al., 2016).

NPS is taken by most of its proponents to address merely a single factor in a two-factor view, hence being an account of specific phenomenal character, but not of why one has an experience (i.e. a phenomenally conscious state) at all.[2] According to Sascha Benjamin Fink's ambitious proposal (in FK), however, NPS – suitably adjusted – could serve as a *general one-factor*

[2] What sort of *account* of phenomenal character does NPS aim to provide? Fink and Kob (in FK, p. 114) tell us that structural features of experiences individuate phenomenal character in *wholly determining* the fact that one's experience has this or that specific phenomenal character. They explain that, in general, if two entities stand in exactly the same relations to other entities, thus having the same 'structural features', then structuralists must treat these entities as identical. Applied to phenomenal character, this means that there is nothing more to phenomenal character than relational, i.e. structural features of experiences. A view like this leads to questions regarding whether someone who knew all the structural features of an experience, for example Frank Jackson's (1982) Mary, could in principle derive, or deduce the specific phenomenal character of the experience. As far as we know, NPS theorists do not comment on this issue and it seems to us NPS may well be vulnerable to Jackson's knowledge argument and other challenges based on the existence of the 'epistemic gap' (see Chalmers, 2010). To be fair, however, even if that's the case, NPS would *not* be worse off here than other theories of consciousness, which it aims to be an alternative to.

theory of consciousness that accounts for phenomenal consciousness, including its specific character, *en bloc*. That is, the structural formation of phenomenal character is of such a nature, according to Fink, that it would be, at the same time, consciousness-generating. Once we have, then, all the required structural features in place, we *ipso facto* have *conscious* phenomenal character, or – in other words – *experience* with its specific phenomenal character, Fink suggests.

To understand Fink's proposal, it's helpful to first clarify what the structural features mentioned in the previous paragraph are features *of* – what, in other words, are the *relata* that are relevantly *structured*. When FK (p. 115) discuss the *individuation claim* (the thesis that phenomenal character is individuated relationally), they write that the relations which individuate phenomenal character are relations between experiences, hence, structural features *of experiences*. Later on, Fink and Kob indeed add that the structures or relations in question are *intra-phenomenal* in the sense of being accessible to the experiencer. Note, however, that while the structural features that individuate a specific phenomenal character (making it blueish, and not-greenish, for example), may perhaps be a matter of relations between experiences,[3] it's hard to see how the structural features that make a mental state conscious, *hence making it an experience* in the first place, could themselves be a matter of relations between experiences. Insofar as the existence of experiences is what one aims to account for, one's account should not invoke (relations between) experiences as an *explanans,* as that would seem circular, we suggest.[4]

[3] As we explain in section 1, many NPS theorists in fact hold that these similarities and differences are grounded in the roles that the contents of our experiences play in perceptual discriminations (see Rosenthal, 2015).

[4] It might be objected against the individuation claim that an experience, simply in virtue of being an experience, already must have some specific phenomenal character, so a specific phenomenal character should *not* be explained by relations *among experiences*. Such an objection would mirror the point we make regarding explaining, in structuralist terms, why one has an experience at all. In response, NPS theorists presumably say that phenomenal character is individuated by relations between experiences, hence by structural features of experiences, because of the *holistic* character of their view. Fink et al. (2021), for example, argue that "[e]ach experience has its phenomenal character only in virtue of other experiences having specific characters," which suggest that if one only ever had a single type of experience (a far-fetched possibility), then this experience would lack any specific phenomenal character. It could only gain some specific character in virtue of being related to other experiences had by the organism, which play different perceptual roles. NPS theorists, then, would presumably deny that a single experience, in isolation, already has some specific phenomenal character, and in that way attempt to dispel this challenge. Here recall that, as explained, NPS theorists often endorse Rosenthal's quality-space theory which has strong holistic features, since a mental quality's identity is a matter of its position in a space of possible qualities. Since we have some reservations about the holistic intuitions endorsed by NPS, we suspend our judgment about whether their account of phenomenal character could be made plausible.

Those proponents of NPS who aspire to account for the existence of consciousness (or experiences), thus addressing the *criterion question*, then, presumably should not appeal to relations between experiences and should instead appeal to relations between some non-experiential entities. This is indeed what Fink does, invoking certain *neural* structures which, as we'll explain below, he views as responsible for mental states' becoming conscious (see FK, p. 123). This point seems important since it suggests that the theoretical extension that would render NPS a general theory of consciousness, as opposed to merely a theory of phenomenal character, would need to be fairly significant. The more ambitious form of NPS would need to show how one can account for the existence of experience in terms of non-experiential structures – something the less ambitious form of NPS, invoking relations between experiences, doesn't aspire to do. It seems *prima facie* unlikely that a minor extension or modification of NPS could get this significant job done.

To illustrate this point, let us remark that since the individuation claim invokes structural features of *experiences*, it might even be acceptable to those dualists or idealists who view conscious experiences as irreducible to anything non-experiential – these anti-materialists might still hold that what individuates phenomenal character is a matter of differences between experiences. The suggestion that what makes a mental state, or a neural activation, conscious, hence making it an experience, is the presence of

non-conscious, non-experiential entities that display a particular structure, on the other hand, will be hardly acceptable for dualists or idealists of this sort. Of course, for proponents of NPS, this may not be a significant theoretical cost, as they may be materialism-leaning in the first place.[5] Still, we think it illustrates our point that the difference between the less ambitious NPS that targets character only, and the more ambitious NPS that targets experience as a whole, is significant and is unlikely to be merely a matter of a minor theoretical adjustment.

2 The commitments of one-factor NPS+

With these cautionary remarks in place, we are now ready to address the question of whether NPS could be a general theory of consciousness. Here it will help to recall the *individuation claim* and the *mirroring claim* and examine how they relate to NPS as a general theory of consciousness.

As expressed by Fink and Kob, the individuation claim states that the "structure between experiences captures the phenomenal character of any individual experience" (FK, p. 115). While NPS that aspires to be a general theory of consciousness can perhaps accept this claim as its account of phenomenal character, such general NPS (which we will label NPS+) also needs to provide a structuralist account of why one has an experience, or a conscious mental state, in the first place. As explained above, that latter account arguably should not appeal to structure, or relations between *experiences*, because the existence of experiences is what it aims to explain. While proponents of NPS+, then, can accept the individuation claim, that claim does not quite do justice to the scope of NPS+. Still, a claim closely related to the individuation claim might accommodate both the structuralists' account of character as well as their account of why one has an experience. Proponents of NPS+, then, should endorse something like the following *structural determination claim*, we suggest:

> **Structural Determination Claim:** The existence of a conscious experience, including its specific phenomenal character, is wholly determined by structural features.

This claim deserves a commentary: Firstly, the talk of determination should presumably concern *constitutive* determination and aims to express the idea that (only) structural features make it the case that there is experience with its specific character, so that the existence of experience, including its character, is nothing over and above the existence of the structural features in question. If an extra, *non-structural* ingredient was needed, it would seem that we would not end up with a truly structuralist theory, after all. Secondly, the structural determination claim entails the individuation claim but not *vice versa* as the former claim concerns both phenomenal character and the issue of why one has an experience at all. Thirdly, it is for this reason that we opt to speak, more neutrally, of 'determination', rather than of 'individuation'. While the latter term suggests (to us) that one is concerned with how *specific* phenomenal character is individuated, the structural determination claim concerns character but also the *general* feature of being conscious. Finally, thus formulated, the structural determination claim does not specify what the structure in question is structure of, but, in the previous section, we argued that NPS+, in trying to account for the existence of experiences, must hold that, at least in part, the structure in question could not be structure of experiences. Instead, it must be structure of non-experiential entities although – as we will see – this structure may end up getting reflected in experience.

Here a natural view for the materialism-leaning structuralist is to hold that experiences with their character are determined by structural features of the relevant neural basis, where the structural features in question are a matter of how a relevant neural state relates to all other possible neural states of one's brain (FK p. 116). More precisely, each possible neural state (with its specific pattern of activations) is viewed as a point in an abstract neural state space, its identity being fully determined by how it relates,

[5] Here we do not mean to suggest that proponents of the more ambitious NPS that aims to account for experience as a whole (and not merely for specific character) *need* to be materialists. Our point is merely that they need to allow that the existence of experience can be accounted for in terms of structural features of entities that are not themselves experiential.

along multiple dimensions, to other possible neural states of the organism in terms of similarity, distance, topology, and transformation. The emphasis, therefore, is not on individual neuronal properties – such as morphology or firing rates but on the state's relations to other possible neural states. Notably, these relations between patterns of neural activation can be captured using mathematical or topological tools. If NPS+ is true, then, the neural state's relative position within this 'neural manifold' (see Jazayeri & Afraz, 2017), i.e. its structural features, determines and explains whether the individual in question is conscious as well as what her consciousness is like, i.e. the specific phenomenal character of the experience.[6]

What, then, is the picture proponents of NPS+ are suggesting? If the fact that one has an experience at all (regardless of its specific character) is a matter of structure, it would seem that each conscious state must have in its neural basis *some* structural features, due to which the state is conscious. Since these neural structures are important for our discussion, we will label them *consciousness-conferring structures,* or simply *C-structures.* Here the idea is that any NCC would need to involve a C-structure, i.e. some structural feature(s) responsible for the relevant mental state's being conscious, whatever other structural features associated with qualitative contents (hence with specific phenomenal character) it may also involve. If we are right, then, while proponents of NPS+ are still free to endorse the individuation claim, i.e. the claim that structural features determine phenomenal character, the ambition of their view is better captured by the structural determination claim, according to which structural features determine not merely some specific character, but also – due to involving C-structures – the fact that the state in question is conscious.

What, however, should proponents of NPS+ say about the *mirroring claim,* the other tenet of NPS? This claim states that there is close structural similarity, or even isomorphism, between the phenomenal structure of experiences, and the structure of their neural basis. More precisely, this claim demands that the structural role of a neural state that underlies a particular experience, i.e. the relative position of this state within the neural manifold (roughly, the space of all possible neural states the organism can instantiate), reflects, or mirrors the structural role of the experience, i.e. its relative position within the quality space (roughly, the space of all experiences a particular organism could have) (FK, p. 116). Here a frequently cited example is color perception: Neural states associated with different hues tend to form clusters in a representational space whose geometric configuration can be taken to homomorphically reflect the structure of the color quality space (see Brouwer & Heeger, 2009, 2013).

Now, if the neural basis of experiences must include C-structures due to which these experiences are conscious, this leads to the question whether C-structures themselves are somehow mirrored in one's phenomenology, or not. Importantly, the mirroring claim, as formulated by Fink and Kob (in FK), seems compatible with both options, since it merely states that phenomenal structure is preserved in the neural substrate of experience, leaving it open as to whether this substrate includes additional structures, not mirrored in phenomenology. Still, Fink – we think wisely – insists that C-structures do contribute to phenomenology in the sense of being mirrored in it, hence "leaving a phenomenal trace", as he puts it (FK, p. 122).

Fink's insistence that C-structures are reflected in phenomenology looks reasonable in the light of the methodological ambitions of NPS. Recall that, according to NPS, the structure we discover in our phenomenology enables us to place a constraint on candidate NCCs, helping us select the core NCC that mirrors this structure. If, however, C-structures were *not* mirrored in phenomenology, then the methodological constraint would not be all that useful for identifying the NCC because phenomenology would then leave us clueless regarding crucial parts of the NCC that exhibit C-structures and are thus responsible for making the overall mental state

[6] It's interesting to ask how NPS relates to the doctrine of structural realism in the philosophy of science (see Ladyman, 2023). As we see things, these two doctrines are likely largely orthogonal. This is due to the fact that NPS's claims concern specific – and relatively high-level – structures, which suggests that these claims are compatible with both ontic structural realism and more robust forms of realism concerning non-observable entities (notably, Fink and Kob [FK, p. 114] express reservations regarding ontic structural realism). Similarly, even if a strong form of ontic structural realism was true, NPS could still be false since it could still be the case that *other structural features* than those features invoked by NPS determine consciousness.

conscious. If our phenomenology did *not* mirror C-structures, then NPS+ could not help us home in on this crucial consciousness-making mechanism. That would mean that NPS+ could at most help us identify the neural correlate of a specific phenomenal character, but not the neural correlate of the whole experience, which must involve C-structures. If, then, NPS+ wishes to have the methodological merit of allowing us to identify these crucial consciousness-conferring structures, and thus keep the methodological spirit of NPS, it's reasonable to demand that C-structures be mirrored in phenomenology.[7]

This is indeed what Fink holds, suggesting that this makes his NPS+ a one-factor theory. As he emphasizes, for a theory to qualify as a two-factor one, the consciousness-conferring mechanism could not (not even partially) determine the phenomenal character of the mental episode, being mirrored in it – it must merely make the whole episode conscious. If the consciousness-making mechanism contributed to phenomenal character, then it wouldn't be independent from the mechanism that determines character, so one's account of phenomenal character would not be separate from one's account of the consciousness-making mechanism, which means that the resulting view would not be a two-factor one, as Fink sees things. Since, then, Fink intends (likely motivated by something like the methodological considerations described above) for the consciousness-conferring C-structures to "leave a phenomenal trace", he argues that his structuralism is a one-factor theory.[8]

Since a natural construal of such a one-factor NPS+ is materialistic (and this seems to be how Fink views his NPS+), one could wonder whether proponents of such a view can even endorse the mirroring claim. If materialism is true, experience-instances are not ontologically distinct from their neural underpinnings, so it may seem misguided to speak of the structure of experiences being *mirrored* in the structure of these neural underpinnings – it would seem more appropriate to speak of the structures being identical. In response, it seems to us that even if, ontologically speaking, experience instances are identical to complex neural activations, there are still two radically distinct ways in which these complex events, and their respective structures, can be accessed. On the one hand, they can be accessed 'introspectively', from the first-person perspective, and on the other hand, they can be accessed via the objective methods of neuroscience. Given this *epistemic* distinction, one could arguably still say that structure *accessed from the first-person perspective* is mirrored in the structure identified via the objective methods of science, although the talk of mirroring should be taken as somewhat misleading. Strictly speaking, after all, the structure accessed from the first-person perspective is (identical to) some neural structure identified by neuroscience. However this may be, we will grant it here to proponents of NPS (and NPS+) that they are still entitled to speak of mirroring. Perhaps the situation is not dissimilar to when some materialists speak of neural 'correlates' of consciousness even though these are, according to their view, strictly identical to instances of consciousness.

Supposing that the talk of mirroring is meaningful and that C-structures are mirrored in phenomenology, it's important to ask what sort of structures our phenomenology might involve that would mirror the neural C-structures. Here Fink (in FK, p. 123) first usefully formulates four requirements that this 'phenomenal trace' of C-structures, i.e. the phenomenological structure that mirrors neural C-structures, should satisfy. Since C-structures are required for any conscious state, their structural phenomenological reflection would need to be (1) modality-neutral and (2) universally present.[9] Furthermore, Fink suggests, this structure must be (3)

[7] Our point here is that *phenomenology* could not help us directly identify the C-structures if these leave no phenomenal trace. Of course, proponents of NPS+ may employ a different method to identify C-structures. Note, however, that any such method would go outside the methodology of NPS and would arguably face the problems that NPS was designed to tackle. For example, NPS was meant to help identify the NCC proper as those neural activations that mirror one's phenomenal structure. If, however, C-structures do not leave a phenomenal trace, then the NPS methodology itself would not allow us to identify these crucial consciousness-producing structures.

[8] As we explain in footnote 13, this is not the only way to draw the distinction between one-factor and two-factor theories.

[9] These two requirements suggest that Fink presupposes that there must be a *single* structural neural mechanism due to which all of one's experiences are conscious. As far as we can tell, this requirement isn't compulsory and, in principle, NPS+

phenomenologically accessible, which, we take it, amounts to little more than a reiteration that the structure is phenomenological. Finally, the phenomenal structure in question needs to (4) allow for an isomorphic structure to be instantiated in the correlated neural event and thus be describable in neuroscientific terms – this neural structure, we take it, would be just the C-structure responsible for the overall mental state becoming conscious.

Having formulated these general requirements, Fink goes on to search for potential candidates for a phenomenological structure, i.e. 'the phenomenal trace' of the C-structure, that could meet them. After briefly considering, and rejecting, potential ego-centred phenomenal features associated with felt ownership of one's experience, perspectivalness, etc., he proposes that these universal experienced structures are Gestalt-structures,[10] which bind perceptible parts of the perceptual field, such as coloured shapes, into bigger wholes. To illustrate that such Gestalten indeed have a 'phenomenal face', Fink invokes the famous Kanizsa triangle, which we visually experience as a phenomenal whole, instead of merely being individually aware of its black corners. Moreover, the white triangle arguably phenomenally *integrates* or binds the three black corners into a single spatial phenomenal whole, or Gestalt. Considering another example from the auditory domain, Fink notes that, in addition to being aware of individual tones, one also experiences a melody, constituted by these tones, as a temporal Gestalt. In NPS+, as envisioned by Fink, such Gestalten amount to *meta-* or *hyper-structures* (FK, p. 123), providing an overarching framework for the local structures. Importantly, these experienced meta-structures are said to satisfy Fink's requirements in being (1) modality neutral, (2) universally present, and (3) phenomenologically accessible, since we arguably experience Gestalten in all modalities.

Regarding requirement (4), Fink suggests that individual perceptual contents become conscious only if their corresponding neural activations, which involve their own specific structural features, are incorporated into a larger neural structure – so the described phenomenal integration has a neural counterpart. Here the idea is that this larger meta-structure (which qualifies as C-structure because it makes the more local, structurally individuated activations conscious) is the neural isomorph of the experienced Gestalt-structure, which suggests that requirement (4) is met. Entry into consciousness would thus, if Fink is on the right track here, amount to a sort of *clustering* of otherwise non-conscious contents, which would have its structural analogue in integration or ordering of local structures of neural activations into larger structural wholes. Since, however, this integration leaves its own phenomenal trace in terms of the experienced Gestalt-structures, hence arguably adding phenomenal content, as well as impacting (e.g., ordering) the more local contents in making them conscious,[11] the resulting theory is, as Fink sees things, a one-factor one.

Before assessing Fink's proposal, let us remark that it's unclear to us that Fink here uses 'structure' and 'structural features' to denote (the system of) relations between possible experiences or neural states, which we take to be how NPS theorists typically employ these terms (see sections 1 and 2 for discussion). It would seem that Fink rather invokes structures within (visual) experiences and structures within neural states (where some neural events are organized into larger ones, for example). While Fink is, of course, free to speak in this way, thus arguably diverging from the standard NPS use of these terms, we note that more clarity regarding how these 'slippery' terms are used would be welcome.

3 Three challenges for Fink's NPS+

While we appreciate the ingenuity of Fink's proposal, we will now argue that his conception of NPS+ faces serious difficulties. To begin with, there is evidence that forms of Gestalt grouping can occur even in the absence of

seems compatible with there being several such consciousness-conferring structural mechanisms, for example one for each modality. If that were the case, there would then be several 'phenomenal traces', none of which would need to be modality-neutral or universally present.

[10] Fink presumably uses this term in a non-technical sense, i.e. not in the sense of specific principles uncovered by Gestalt psychologists of the early 20th century.

[11] See, e.g., (Hvorecký, 2023) for more discussion of the view that the consciousness-conferring mechanism contributes contents to the overall conscious state.

conscious perception, which would suggest that such groupings do not, on their own, suffice to make a mental state conscious. For example, Mudrik and colleagues (Mudrik et al., 2011) have provided empirical evidence for the view that we can grasp the gist of a whole perceptual scene, hence a grouped perceptual Gestalt, even unconsciously. According to Mudrik and colleagues, we can perceptually integrate objects and their properties with their overall background even without awareness of either. They used the continuous flash suppression masking technique (CFS), which involves presenting a dynamic, high-contrast mask to one eye while simultaneously presenting the target stimulus to the other eye. This renders the target stimulus unconscious for extended periods of time. Mudrik et al. prepared a series of congruent and incongruent pairs of scenes, carefully designed so that the levels of contrast and the placement of objects were identical in both versions. Examples of a congruent scene are a woman putting food in the oven, or an athlete playing basketball with a ball; examples of incongruent scenes are a woman putting a chessboard in the oven or an athlete playing basketball with a watermelon. Mudrik et al. demonstrated that when subjected to masking with CFS, complex visual scenes involving incongruent objects consistently escaped the CFS-generated perceptual suppression faster than congruent scenes did – the mean breaking suppression times for congruent scenes was 300 ms slower than for incongruent scenes.

As we see it, unless one assumes that (at least the gist of) incongruent scenes were perceived unconsciously, one has no obvious explanation of why the incongruent scenes escaped perceptual suppression faster; one would have to assume that the difference in suppression escape times was a matter of pure coincidence. As this is unlikely, one has reason to believe that in the experiment of Mudrik et al., the Gestalt-like gist of the scene was perceived unconsciously. And because the effect was observed across diverse scene categories, one has further ground to generalize the capacity for unconscious Gestalt formation, instead of treating it as a category-specific phenomenon limited to certain types of perceptual objects.

In a similar vein, there is some evidence that illusory shapes, such as the above-mentioned Kanizsa triangles which, notably, Fink (FK, p. 124) presents as an example of a conscious-only Gestalt, can be perceived unconsciously. (Jimenez et al., 2017) employed an innovative combination of CFS and metacontrast masking to render Kanizsa figures unconscious. Dynamic Mondrian patterns were presented to one eye at 10Hz frequency, while the target stimuli (either Kanizsa or control configurations) were presented to the other eye at progressively increasing contrast levels. Jimenez et al. demonstrated a reliable priming effect where unconsciously presented Kanizsa triangles facilitated subsequent responses to consciously presented triangles. This priming effect was significantly stronger for actual Kanizsa configurations compared to control configurations with identical inducers but no illusory contours, suggesting that the visual system extracted the emergent illusory shape without awareness.[12]

Given such results, it becomes unclear why perceptual Gestalts should be limited to conscious states only. Both the unconscious gist and the unconscious illusory perception experiments strongly indicate unconscious perceptual grouping. The integration of objects with backgrounds (the Mudrik et al. experiment; see also (Bolte & Goschke, 2008) and (Zhang et al., 2013) for similar results) and perceptual grouping of inducers forming illusory contours (the Jimenez et al. experiment; similar results reported in (Persuh et al., 2016); (Poscoliero et al., 2013); (Wang et al., 2012)) imply that holistic perceptual grouping can be achieved without awareness. This contradicts Fink's idea that Gestalts emerge only when elements are bound in consciousness, and suggests that the neural mechanism responsible for Gestalt-formation is unlikely to be the consciousness-conferring mechanism.

Additionally, perceptual Ganzfelds, such as an equally luminous and saturated wall of pink colour, do not seem to have a Gestalt structure at all, yet can appear in consciousness (see Zdravkovic, 2023), and the same holds for migraine headaches and other types of mental states. The Gestalt explanation of becoming conscious thus does not work for them. Notably, while the experiments discussed in the previous paragraph are meant to show that Gestalt formation is not sufficient for consciousness,

[12] It should be noted that this evidence is inconclusive; see (Harris et al., 2011) and (Banica & Schwarzkopf, 2016) for discussion.

the Ganzfeld cases arguably show that Gestalt formation is not necessary for consciousness either.

Another challenge we wish to raise for NPS+ has to do with Fink's claim that the structural mechanism responsible for a mental state's being conscious, i.e. the C-structure, itself leaves a phenomenal trace. As we explained, this claim is important as otherwise NPS+ would lose much of its methodological appeal because phenomenology then would not allow us to home in on the C-structure, a crucial consciousness-making part of the NCC. To see the challenge we have in mind, recall that, according to Fink, the phenomenological trace of the C-structures consists in the presence of certain Gestalt-structures in one's experience. Considered on its own, Fink's view that we experience Gestalt-structures, as well as the examples he offers, seem plausible to us for many cases of visual and auditory consciousness. However, as we'll now explain, Fink's NPS+ fails to account for why we are conscious of such Gestalts, or other phenomenal traces of C-structures.

To see this problem, recall that, according to Fink, the various modality-specific qualitative contents enter consciousness due to their neural correlates' being incorporated into larger structures (FK, p. 124). This *general mechanism*, due to which contents become conscious, moreover, leaves its own structural phenomenal trace, we are told. But how does this mechanism, constituted by C-structures, become something that gets mirrored in consciousness, leaving a phenomenal trace? As far as we can tell, Fink's theory does not address this issue: Even if we accepted that getting incorporated into a larger structure renders the *embedded* structures phenomenally conscious (which we are unsure about), it still seems unclear how this larger structure itself becomes conscious, hence leaving a phenomenal trace. Surely 'being embedded or incorporated in something' is not a relation a thing can stand in with respect to itself – this relation looks irreflexive. This means, however, that it's hard to see how the incorporating structures could render *themselves* phenomenally conscious, which is just what is needed if they are to leave a phenomenal trace.

Here Fink might suggest that this larger incorporating structure, call it LS, leaves a phenomenal trace due to the same sort of incorporation mechanism too, since it is itself incorporated in a still larger structure, call it LS*, where this structure makes LS conscious. But this response merely postpones the problem, as we'll explain. Either, after all, LS* is not conscious, not leaving a phenomenal trace, which would mean that we would be left in the dark regarding a crucial part of the relevant NCC, namely the part that renders LS conscious. If, on the other hand, LS* is thought to leave a phenomenal trace, it seems that a yet larger structure LS**, incorporating LS*, would be needed and the same uncomfortable questions would arise for LS** and for any still larger incorporating structure.

While, then, this response avoids the mystery of how LS could make *itself* conscious, it leads proponents of NPS+ into a vicious infinite regress of incorporating structures (LS, LS*, LS**, LS***, etc. *ad infinitum*), each of which is larger than the previous one and incorporates the previous one hence making it conscious. Since each of these structures, due to its being thus incorporated, leaves a phenomenal trace, the resulting picture is one where each experience is infinitely phenomenally complex, which is highly implausible. To avoid this infinite regress, Fink would need to hold that one of these incorporating structures, say LS*, does not leave a phenomenal trace, which means that it need not be incorporated in a larger structure (LS**). While that would block the regress, it would mean that our phenomenology would leave us in the dark regarding the structural mechanism that makes LS* conscious, hence the methodological promise of NPS+ would be significantly compromised – we would need a different method to identify the neural mechanism due to which LS* leaves a phenomenal trace, moving methodologically beyond NPS. If we are right, then, Fink faces the following dilemma: Either his conception leads to a vicious infinite regress of incorporating structures, or the methodological promise of NPS+ is significantly compromised. Since this dilemma concerns the issue of whether certain neural structures are mirrored in consciousness, leaving a phenomenal trace, or not, we like to call it the *mirroring dilemma*. As we see it, this dilemma poses a serious obstacle for Fink's proposal of NPS construed as a general theory of consciousness.

If we are right, then, Fink's proposal to employ NPS as a one-factor theory of consciousness looks problematic since, firstly, empirical work seems to show that we perceive the gist of visual scenes, and the relevant

Gestalten, even without consciousness, which suggests that Gestalten are not sufficient for consciousness. Secondly, we commonly enjoy Ganzfeld experiences which seem to lack Gestalt structures altogether, which suggests that Gestalten are not necessary for consciousness either. Thirdly, proponents of Fink's account seem to face the mirroring dilemma, which forces them into a hard choice between a vicious infinite regress of incorporating structures, or significantly compromising the methodological promise of NPS+.

4 Could there be a two-factor NPS+?

These problems with Fink's proposal may lead one to ask whether there could be a form of NPS+, understood as a *two-factor* view, that would hold more promise. On a two-factor view, the consciousness-conferring mechanism could be independent from the mechanism of the formation of phenomenal Gestalts, so the unconscious gist objection could be averted. Such an independent consciousness-conferring mechanism would also allow for Ganzfeld experiences which may not involve any Gestalt structures. Moreover, a two-factor view would not involve a commitment to the consciousness-conferring mechanism's leaving a phenomenal trace,[13] so the mirroring dilemma would not apply to it.

The possibility of a two-factor NPS+, then, seems well-worth examining. Notably, such a theory would need to significantly limit the methodological ambitions of NPS. As explained above, two-factor views require that the consciousness-making mechanism does not 'leave a phenomenal trace', hence does not contribute to phenomenal character, which would mean that phenomenal structures could not give us any structural hints regarding this neural mechanism. Phenomenal structures, then, would not enable us to fully identify candidate NCCs, keeping us in the dark regarding the structure of the consciousness-making mechanism.

Still, perhaps Fink, or other proponents of NPS, would be willing to sacrifice some of the view's methodological ambition in the name of a greater scope of NPS+ and endorse the weaker thesis that phenomenal structures merely inform us about the structure of the phenomenal character-related parts of the NCC. This would allow them to embrace a two-factor form of NPS+, according to which *one* sort of structural principles govern the formation of perceptual contents, which need not be conscious to exist, and *other* structural principles determine that these contents enter consciousness. While the formation of (conscious or non-conscious) perceptual contents would be tackled using the standard NPS account, NPS+ would need an additional structural feature or mechanism – call it 'X' – which would be needed to uptake the unconscious visual, auditory and other contents into consciousness.

There are some familiar ways to develop the story about X. One standard account here is Rosenthal's: contents are lifted into consciousness by higher-order thoughts (Rosenthal, 2005). Alternatively, Recurrent Processing Theory (Lamme, 2010), Global Neuronal Workspace Theory (Mashour et al., 2020) and other types of theories might perhaps also be adaptable for this role. However, we see at least two problems with proponents' of NPS+ helping themselves to one of these theories.

For one thing, it's unclear that any of these 'standard' theories counts as structuralist in the NPS sense. In section (2) and elsewhere in this paper, we explained that a neural or phenomenal state's structural properties are roughly a matter of its relative position in an abstract space of neural

[13] Here we follow Fink who views the consciousness-conferring factor of a two-factor theory of consciousness as closely associated with what Marvan and Polák (2020) call the *gNCC*, or the *general neural correlate of consciousness*. This neural process is, according to these authors, strictly consciousness-conferring and does not contribute any 'phenomenal content' to the conscious state, which means that, using Fink's phrase, it doesn't leave a phenomenal trace. While the consciousness-conferring factor, then, is necessary for there to be any experience, it would not be mirrored in phenomenology, according to this conception. As far as we're concerned, we don't think that this is the only way to construe two-factor views of consciousness. It's natural to view Kriegel's (2009) self-representationalism, for example, as a two-factor view, where the self-representational consciousness-conferring factor itself leaves a phenomenal trace in the form of the 'subjective character' associated with each conscious state (see Giustina, 2022, for an acquaintance-based form of such a two-factor theory). For the purposes of this paper, however, we'll adopt Fink's construal of two-factor theories.

or phenomenal states that the given organism could instantiate. As we see it, it's highly unclear that Rosenthal's higher-order thoughts – unlike mental qualities, as construed by him – gain their identity in this way, hence it's unclear that they are *structural* in the relevant sense. For one thing, these thoughts are verbal entities and it's unclear that there is any abstract space of all thoughts an organism could have, given, for example, the recurrent nature of language. Furthermore, the higher-order thoughts are usually taken to contain self-referential elements (such as '*I now* see…') that seem to be non-structural because their content does not seem to be a purely relational matter.[14] Notably, Fink himself (in FK, p. 124) goes as far as arguing that self-referential and indexical elements of content could not be reconstructed in neuroscientific terms. Moreover, most higher-order theorists hold that causal factors are crucial for determining the content of higher order states (Rosenthal, 2005; see, however, Coleman, 2015) and it is, as we see it, unclear that causal factors can be fully captured in structural terms, as understood by proponents of NPS.[15] Similarly, it's far from clear that RPT or GNWT could be reconstructed in purely structuralist terms as understood by Fink and Kob, i.e. in terms of each state's relative position in a space of possible neural or phenomenal states (see sections 1 and 2 for more discussion).[16]

To be clear, we are not suggesting that these considerations decisively prove that the above-mentioned theories *could* not be reconstructed in something like structuralist terms in the relevant sense. Still, we hope that they suffice to illustrate that it would be a highly non-trivial task for proponents of NPS+ to show that such a *structuralisation* of these theories could be achieved. As such, these considerations are merely intended to shift the burden of proof to proponents of NPS+.

The main problem we see with proponents' of NPS+ invoking one of the listed established theories to account for the consciousness-conferring factor is that, if their theory is meant to be a serious contender, they should aspire to offer their own, *structuralist* take on how contents enter consciousness, instead of adopting an already existing theory whose structuralist credentials are at best dubious. Otherwise, one could easily feel like one merely got a *repackaging* of NPS combined with one of the established theories of the entry into consciousness with its respective well-known merits and pitfalls. It seems important, then, to inquire whether proponents of NPS+ can achieve more than such a repackaging and, in particular, whether a *fully* structuralist theory of consciousness could be defended. This is a question we'll begin addressing in what remains.

5 Two challenges for two-factor NPS+

We will now articulate two challenges for any attempt at a two-factor NPS+, i.e. at a neurophenomenal-structuralism which targets experience as a whole, and not merely its specific phenomenal character.

5.1 The "more of the same" challenge

A general worry one could have here is that a two-factor theorist sympathetic to NPS is likely to think that mere specific structural features, such as the features that, according to proponents of NPS, individuate various contents of consciousness (and thus determine phenomenal character), do not, on their own, suffice for consciousness, insofar as these contents can exist unconsciously, which two-factor theorists typically allow (see Coleman, 2025; Marvan & Coleman, 2024; Rosenthal, 2005). It's natural to worry therefore that merely adding *more of the same*, i.e. further structural features, could not explain why the initial, structurally individuated contents become conscious. We believe, therefore, that serious proponents of a two-factor NPS+ would need to face up to this *more of the same challenge* – a

[14] We take it that similar concerns apply to other forms of the higher-order theories (e.g., Brown et al., 2019; Lau, 2008).

[15] We take this claim to be compatible with Chalmers' view that causal factors could be captured in what *he* calls 'structural' (e.g., nomological, spatiotemporal, etc.) terms given his specific conception of these terms. We say more about Chalmers' conception of structural terms and its relation to the conception that proponents of NPS have in mind in section 5.1.

[16] See, however, (Fleming & Shea, 2024) for an attempt at a structuralist reading of GNWT.

challenge of explaining why merely adding further structural features to the character-related structures will constitute the desired X – the envisioned mechanism that would raise perceptual contents into consciousness.

Here Fink's idea that in order for content-related structures to enter consciousness, these structures must be incorporated in larger structures, or 'meta-structures' (FK, p. 124) may perhaps suggest a candidate for X – the structural mechanism of entry into consciousness.[17] Still, it seems to us that much more would need to be said concerning why and under which circumstances being incorporated in a meta-structure must result in the relevant contents-related structures becoming conscious. Presumably there are many structures incorporated in larger structures where the incorporated structures are not conscious so one would like to know what is special about those meta-structures that do render their incorporated structures conscious. However this may be, we think that NPS+ faces a general challenge to clarify why some structural features can lift other structures, associated with specific phenomenal character, into consciousness and thereby clarify what X amounts to. Without a plausible account of how this happens, the *more of the same challenge* against NPS+ will be hard to avert.[18] It remains to be seen whether NPS+ can face up to this challenge.

It's interesting to ask how the *more of the same challenge* is related to Chalmers' (1995) 'hard problem' of consciousness, i.e. the problem of accounting for why the cognitive processing in one's brain involves experience, or why there is something it's like for one, subjectively, to undergo these cognitive processes. According to Chalmers, this problem is 'hard' because it eludes the standard methods of cognitive science. While the 'hard problem' concerns experience as a whole, i.e. the specific phenomenal character of the experience as well as the fact that the experience is conscious, we have focused specifically on the latter issue while being agnostic about whether NPS can account for specific phenomenal character. Moreover, while the 'hard problem' is a problem for any materialist approach to consciousness, the more of the same challenge, as we have articulated it here, concerns specifically two-factor NPS+. Since proponents of two-factor views typically allow that structurally individuated phenomenal character can exist unconsciously, they need an account of why adding more structural features should produce a state that is conscious, it seems to us. The more of the same challenge, then, should be viewed, if we are right, as one dimension of the hard problem that (1) is tailored to two-dimensional NPS+, and (2) focuses on the issue of why one has a conscious state at all, rather than why one has a conscious state with a specific character.

The more of the same challenge may also resemble Chalmers' (2010) 'structure and dynamics' argument against materialism (that is itself related to the 'hard problem'). Here the idea is that standard scientific explanations concern at most structure and dynamics of the world, but consciousness amounts to more than structure and dynamics, which means that standard science must fall short of accounting for consciousness. Both the structure and dynamics argument and the more of the same challenge, then, aim to show, roughly, that appeals to structure seem ineffective with regard to consciousness. There are some important differences though: Firstly, while the structure and dynamics argument targets consciousness as a whole, the more of the same challenge has a more specific target – namely the fact that a particular experience is conscious at all, regardless of its character. Secondly, the more of the same challenge does not rely on the through-and-through structuralist view of the physical knowledge that Chalmers endorses[19] – it seems equally compatible with views of physical knowledge that are not fully structuralist. Thirdly, Chalmers seems to work with what looks like a significantly different conception of 'structure' from that employed by proponents of NPS. By 'structure', Chalmers here means spatiotemporal and formal structure – as he puts it, a structural description

[17] Here we bracket the fact that Fink himself views his theory as a one-factor one.

[18] One reaction to this challenge would be to suggest that consciousness of the whole episode *emerges,* in some strong sense (see Chalmers, 2008), from certain structural features. We assume however, that strong emergence would not be acceptable for proponents of NPS+ as this theory aspires to provide an intelligible and perspicuous account of consciousness.

[19] Chalmers' understanding of physical knowledge looks like a version of *epistemic structural realism* (see Ladyman, 2023). We say more about structural realism and its relation to NPS+ in footnote 6.

involves at most spatiotemporal, nomic, logical and mathematical vocabulary (Chalmers, 2010). For proponents of NPS, on the other hand, 'structure' is a general concept that they cash out in *relational* terms: roughly, structural features of an experience amount to a set of its relations to other possible experiences while structural features of a neural activation pattern amount to a set of its relations to other possible activations. Notably, Chalmers (2010) seems to reject this general conception of structural properties as relational properties. The NPS construal of structure then seems to significantly differ from what Chalmers has in mind, which supports our claim that the *more of the same challenge* importantly differs from Chalmers' *structure and dynamics argument*.

5.2 The structure-selection challenge

Another challenge that we think two-factor NPS+ would need to address amounts to accounting for why the structuralist consciousness-making mechanism only seems to raise *some* structures into consciousness, while leaving other structures unconscious. While the *more of the same challenge*, then, concerns the question of why some structures, but not others, are capable of making other, content-related structures conscious, this *structure-selection challenge* concerns the question of why some neural structures, but not others, are selected by the relevant structural mechanism to become conscious.

The structure-selection challenge is rooted in a sort of *structural discrepancy* – there seems to be more structure in the content-relevant areas of the brain than there is in the experience one ends up undergoing.[20] It isn't hard to find empirical support for the discrepancy we have in mind. Experiments coming from various lines of research provide convergent evidence that some unconscious neural representations are more finely grained than the conscious ones. To put it differently, there is a downgrading of resolution for at least some contents reaching consciousness. If we accept NPS, we can reformulate this discrepancy as: some neural structures are more fine-grained than those that are mirrored in consciousness. Indeed, Fink (Fink, 2024) suggests that only some activated neural structures are going to be mirrored in consciousness. The challenge we have in mind is to explain, in structuralist terms, why only some of these structures are selected to enter consciousness while others are not.

Here are some empirical examples of what we have in mind. Diana Raffman (see 2011, pp. 116–119) describes an experiment she conducted with her colleagues Del Lindsey and Angela Brown. The point of the experiment is that we can unconsciously discern finer differences in wavelength – the basis of colour perception – than we can do consciously. The participants in their study were presented with a series of 41 patches of green colour. The patches, ordered in a circle, were incrementally differing in wavelength as the circle progressed. However, their wavelength differences were so small that consciously, the participants were not able to discern any difference between the hues of adjacent pairs of patches (except for the two patches at the 'beginning' and 'end' of the circle, which were clearly marked). Intriguingly, though, as the participants were moving around the circle of patches, they were able to use unconscious visual information to reliably track the gradually ascending wavelength of the patches. Notice that no visual masking or any such perceptual interference was applied. The subjects had the entire conscious visual information at their disposal, yet were unable to consciously distinguish the hues below a certain threshold.

What this experiment nicely demonstrates is that the resolution of conscious colour perception is somewhat coarser than the representational capacity of the unconscious mind. In NPS terms: there are aspects of the neural structure that partly constitute the qualitative dimension of colours (e.g., specifying the wavelength information), yet are not mirrored in consciousness. Colour flicker fusion provides another example of the same phenomenon. We can unconsciously 'track' alternating circles of complementary colours (say, green and red) at frequencies so high that consciously the alternating circles disappear and are replaced by a fused disk of a single

[20] As we understand it, because much perception-related contents are generated unconsciously, the content-relevant brain areas significantly surpass the NCC of perceptual contents.

colour (in this case, yellow).[21] Yet another example concerns spatial frequency resolution of vision. We can unconsciously discern the orientation of gratings of such high spatial frequencies that we cannot perceive their orientations consciously; consciously, what we see looks like a uniform field with no discernible spatial structure. However, the unconsciously registered orientations of the patches still affect perception and behaviour, as witnessed by various perceptual after-effects (He & MacLeod, 2001).

In all these examples, some neural structures contribute to the qualitative aspect of vision, yet outstrip conscious visual phenomenology. Although they are activated, and influence behaviour, they are not registered in consciousness. Simply put, these empirical cases strongly suggest that subjects often instantiate *perceptual structures* that do not make it into consciousness, hence do not 'leave a phenomenal trace'. The challenge for NPS+, to repeat, is to explain, in structuralist terms, why only some of the total activated neural structures underlying visual perception are selected to appear in consciousness.

It is not easy (for us) to see how one could resolve the structure-selection challenge by appealing to structuralist principles alone. One would expect that an account of why coarser structures are selected for consciousness while finer ones remain unconscious will need to involve *non-structuralist* principles having to do with, e. g., evolutionary pressures on conscious perception. Here the thought might be that it makes no sense for conscious perception to be of exceptionally high resolution, as this would serve no obvious evolutionary purpose. It's unclear on the other hand, how one could account for the relatively coarse-grained nature of *conscious* contents in purely structural terms. That would mean that a purely structuralist theory is unable to account for the nature of conscious contents. Neither is such a theory – if the *more of the same challenge* is plausible – able to account for these contents' becoming conscious.

Notably, this structure-selection challenge does not seem to be pressing for weaker NPS theories which merely claim that systematic changes in structured neural activations account for – and determine – corresponding changes in aspects of our phenomenology (see Fink 2024). Insofar as those theories do not have the ambition to account for the consciousness-making mechanism, they do not need to directly address the structure-selection challenge since they can delegate the job of addressing this challenge to their preferred (non-structuralist) theory that addresses the *criterion question* of what makes a mental state conscious. However, the more ambitious NPS+ account needs to face this challenge head-on, we submit.

6 Concluding remarks

While most proponents of neurophenomenal structuralism (NPS) limit the scope of their view to specific phenomenal character of experiences, according to Sascha Fink (in FK), the theory can also account for why one has an experience (i.e. a conscious state) at all, which would mean that structuralism can serve as a general theory of consciousness. Fink goes on to suggest a version of such a general NPS, which we have labelled NPS+, according to which the character-related structural features are incorporated in larger meta-structures that, according to Fink, make the incorporated character-related structures conscious, while being themselves mirrored in our phenomenology.

We examined the commitments of NPS+, noting that proponents of NPS+ should endorse *the structural determination claim* which states that the existence of a conscious experience, including its specific phenomenal character, is wholly determined by structural features. As we see it, this claim is significantly stronger than the *individuation claim*, which proponents of NPS usually endorse. Having shed light on the commitments of NPS+, we argued that Fink's proposed form of NPS+ faces three serious challenges: the *unconsciously perceived gist objection,* the existence of *Ganzfelds*, and the *mirroring dilemma*. According to the first challenge, there is significant empirical evidence for the existence of unconscious Gestalten, which suggests, against Fink's proposal, that the neural mechanism responsible for Gestalt-formation does *not* suffice to make the mental state in question conscious. Worse yet, the apparent existence of Ganzfeld expe-

[21] See (Gur & Snodderly, 1997); (Jiang et al., 2007).

riences which don't seem to involve Gestalt-structures, suggests that such structures are not necessary for consciousness either. The third challenge, *the mirroring dilemma*, starts from the observation that Fink's approach, according to which character-related structures become conscious due to being incorporated in larger (meta-)structures, leaves it highly unclear how such consciousness-conferring larger structures could 'leave a phenomenal trace', as Fink posits. If we are right, this leads Fink into a dilemma of having to choose between an infinite regress of incorporating structures, or significantly compromising the methodological merits of NPS+.

Finally, we formulated two challenges for *any* fully structuralist two-factor theory of consciousness. While the *more of the same challenge* invites structuralists to specify what is special about the consciousness-conferring structures that allows them to make other structures conscious, the *structure-selection challenge* concerns the question of why only some character-related neural structures are selected by the consciousness-conferring structural mechanism, while other relevant structures remain 'behind the door of consciousness', so to speak. Notably, proponents of NPS+ would need to address both challenges by *appealing to structural features only* which looks like a considerable task. Since, after all, structural features can (and often do) exist unconsciously, as proponents of two-factor structuralist theories should allow, it would seem that other, non-structural features are needed for the relevant system to produce consciousness (*the more of the same challenge*). Worse yet, it seems that non-structural features, such as evolutionary factors, will need to play a role in determining which structurally individuated perceptual contents are selected for consciousness (*the structure-selection challenge*). As we explained, it's highly unclear that NPS+ has resources to successfully meet these challenges, which is why we are not optimistic about its prospects.

NPS, then, may well be on a crossroads: Either it will settle with the more modest scope, where the theory addresses the individuation of phenomenal character only, and not of its becoming conscious, or it will embark on the more adventurous, potentially more original, but also much riskier journey towards the goal of formulating a general theory of consciousness. If the present paper is on the right track, this goal is unlikely to be achieved given the commitments of NPS.

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