

# The Standard Theory of Conscious Perception

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## Introduction

In the cognitive sciences, attention is thought to sort and rank neural processing, resulting in the selection of percepts and the behavioral responses to those percepts. When understood this way, attention may seem a curious fascination for philosophers. I here support the philosophical study of attention by arguing that the prioritization work of attention is constitutive of and essential to the structure of conscious perception.<sup>1</sup> I present this argument through a theory, which I call the “Standard Theory.” According to this theory, attention provides for the division and unity<sup>2</sup> found across all perceptual experience by prioritizing elements of each perceptual feature type against a global, subjective standard, using a spatio-temporal framework common to all types of features to do so.<sup>3</sup> The theory is based on the claim that all perceptual experience is divided into elements that are nonetheless integrated with respect to the source of experience, the subject. Since sensation does not have this structure of division and unity (which I argue through an examination of its neural correlates), something will be required to bring about such structure. I show that only prioritization by the subject can supply this structure, and so attention is not only causally but constitutively necessary for conscious perception.

The Standard Theory is original in its details but not in its vision. William James connects attention to the division and unity of conscious perception in his *Principles of Psychology*.

Millions of items of the outward order are present to my senses which never properly enter into my experience. Why? Because they have no *interest* for me. *My experience is what I agree to attend to.* Only those items which I *notice* shape my mind – without selective interest, experience is an utter chaos. Interest alone gives accent and emphasis, light and shade, background and foreground – intelligible perspective, in a word. It varies in every creature, but without it the consciousness of every creature would be a gray chaotic indiscriminateness, impossible for us even to conceive. (James, 1981, p. 403)

James claims here that it is interest on the part of the experiencing subject that determines the content of perception, both in quantity and in quality. His claim rests on evidence of sensory selection (“Millions of items...never properly enter into my experience”) together with the idea that such selection must be governed by interest. But *quantitative* selection need not occur at the subject-level (that is, it need not be within

the control of the experiencing subject), since it can conceivably take place through pre-subjective filtering.<sup>4</sup> Thus, the fact that we do not perceive all of the “items” surrounding us does not by itself show us that the interest of attention is the gateway to conscious perception. Nonetheless, James’ intuition that the interest of attention provides for the *qualitative* content of conscious perception finds support in the Standard Theory.

Maurice Merleau-Ponty, on the other hand, entertains the notion that attention is responsible for the common spatio-temporal framework of conscious perception. In the Introduction to *Phenomenology of Perception*, he makes the following observation.

Attention first of all presupposes a transformation of the mental field, a new way for consciousness to be present to its objects. Take the act of attention whereby I locate a point on my body which is being touched....A *vaguely located spot*, this contradictory phenomenon reveals a pre-objective space where there is indeed extension, since several points on the body touched together are not confused by the subject, but as yet no univocal position, because no spatial framework persists from one perception to another. The first operation of attention is, then, to create for itself a *field*, either perceptual or mental, which can be “surveyed” (Merleau-Ponty, 1962, pp. 33-34, translation amended)

<sup>1</sup> Sebastian Watzl has recently published a paper claiming that attention *is* the structuring of conscious experience: “every form of attention consists in a structuring of one’s conscious point of view” (Watzl, 2011, p. 2). I disagree that the concept of attention is necessarily tied to conscious experience and have thus argued that attention is the more general process of subject-level prioritization. Despite this disagreement, the description that Watzl gives of attention is very similar to what I argue is attention’s key contribution to conscious experience.

<sup>2</sup> The division and unity assumed in the Standard Theory is akin to that which is rejected as being a critical feature of conscious experience by Semir Zeki (2003) and Jesse Prinz (2011).

<sup>3</sup> I call it the Standard Theory to highlight the role of this global standard in attention; the ambiguity between this and the other meaning of “standard” (i.e. generally accepted) is unfortunate but, I think, amusing.

<sup>4</sup> That selection sometimes occurs through pre-subjective filtering that is *not* due to attention is a point that I argue for elsewhere (under revision), but the basic thought is that “attention” only properly applies to those processes that are within the subject’s control and that this understanding of attention enables us to separate attention from merely reflexive resource distribution.

Here, Merleau-Ponty claims that although experience outside of conscious perception is not itself unorganized (two points on the body are easily distinguished), attention allows for a new type of organization by creating a “field” of objective space for itself. Attention transforms conscious experience from pre-objective to objective space by invoking a common spatio-temporal framework, according to Merleau-Ponty.

Merleau-Ponty looks at the phenomenon of directed search to argue that attention transforms pre-objective to objective experience, contrasting his view with the non-transformative views of attention that he credits to empiricists and rationalists. He points out that directed search requires both some determinacy and some indeterminacy on the part of the subject (Merleau-Ponty, 1962, p. 33). When I use attention to search for a pen on the surface of my desk, for example, I must have both enough determinacy to guide my search (e.g. the pen is somewhere on my desk) and enough indeterminacy to drive my search (e.g. but I don’t know where). Our ability to have some determinacy in directed search entails that the resulting sensory knowledge will not be entirely new or “pure” (contrary to the “empiricist” view, as Merleau-Ponty construes it). On the other hand, if the result of our search is completely circumscribed by the determinacy guiding it (as the “rationalist” contends, according to Merleau-Ponty), then we do not have the requisite indeterminacy to account for the fact of searching. Thus, attention aids directed search by bringing new sensory knowledge into the space of the subject, transforming it into something that is searchable. According to Merleau-Ponty, attention should be understood to play the role of connecting the realm of structured thought to sensory experience through the subject’s transformative activity, making it possible for the unknown to enter into the realm of the knowable.

The Standard Theory gives a working account of these phenomenological intuitions. Namely, the Standard Theory shows how attention transforms the processing of sensations into the processing of percepts by prioritizing the former with respect to a global subjective standard. According to the Standard Theory, this transformation brings about both the content of perception, as flagged by James, and the determination of a perceptual field, as flagged by Merleau-Ponty. Thus, the Standard Theory is an account of how the subject brings about the structure of conscious perception through the activity of attention.

### Twin Problems

To start, it may be helpful to introduce working definitions of “attention” and “conscious perception.” I assert that “attention” should be understood as the process of prioritizing mental events by a “subject,” where the subject is that which we infer from our own experience is having that experience and that which we infer from the behavior of certain organisms is normally governing their behavior. I take this understanding of attention, as “subject-level” prioritization, to be in keeping with phenomenal experience: attention is felt as an increase in phenomenal *priority* for a *subject*. I also take it to fit with behavioral evidence: attention improves the

likelihood of stimulus response, or behavioral *priority*, by a *subject*.<sup>5</sup>

“Conscious perception,” on the other hand, normally refers to the experience of sensory content<sup>6</sup> arranged within a space-time framework (or the process leading to that experience, where the process need not be fully conscious). Although sensations may have spatio-temporal locations, sensation is thought to differ from conscious perception in lacking content. That is, unlike sensation, conscious perception presents the world as being a certain way to the subject. This “being a certain way” involves both shared attributes between the many items of content and particular instantiations of those attributes held by each item. A stargazer, for example, experiences stars as each having relative brightness: they share the perceptual quality of brightness, but each of them instantiates a particular degree of brightness. As Tyler Burge puts it: “a perception—a representational perceptual state instance, or the content of a perceptual state instance—must always involve the context-dependent singular application of (general) perceptual attributes” (Burge, 2010, p. 381). Perhaps we could provisionally characterize conscious perception as the experience of sensory elements bound to a spatio-temporal structure, where “elements” signifies the particularities of generalities, and where this spatio-temporal structure may include localized events, patterns, or simply spatio-temporal depth.<sup>7</sup>

A full characterization of conscious content has been undertaken by Giulio Tononi in his Information Integration Theory, where he describes such content in terms of information. As Tononi puts it,

every time we experience a particular conscious state out of such a huge repertoire of possible conscious states, we gain access to a correspondingly large amount of information. This conclusion is in line with the classical definition of information as reduction of uncertainty among a number of alternatives (Shannon and Weaver, 1949)...the information generated by the occurrence of a particular conscious state lies in the large number of different conscious states that *could potentially* have been experienced but were not. (Tononi, 2005, p. 111)

In other words, conscious content is inherently informational, according to Tononi, in that every individual experience is inherently linked to other possible experiences and *is* a conscious experience only to the extent that it is contrasted with those other possible experiences. An example

<sup>5</sup> Again, this view of attention is justified at some length in an upcoming publication on the topic.

<sup>6</sup> My use of the term “content” is purposefully ambiguous between external (as in direct realism), internal (as in sense-data theory), and relational content.

<sup>7</sup> Although I take it that these remarks hold for all varieties of conscious perception, I will focus in this paper on visual perception. I address non-perceptual experience in another paper (under revision), but I am not yet sure where some in-between cases, such as olfaction, fit in to this picture.

that Tononi frequently uses to motivate this idea (the idea that conscious content is inherently informational) is the visual experience of a completely dark room: such an experience only has visual content if “content” measures what is present against what is possible, since it has no intrinsic content.<sup>8</sup> That is, a room devoid of light has visual content only when compared with other possible visual experiences one could have. In contrast, visual sensation, which does not have the informational content of perceptual experience, relies on the presence of light. The fact that we experience total darkness shows us that conscious content is inherently informational, since experience would otherwise diminish and disappear in the absence of intrinsic content. In Tononi’s view, even the conscious perception of a homogenous plane of light has a lot of information for us, since its content is generated in contrast to other possible experiences.<sup>9</sup>

Tononi further notes that the information of conscious content is integrated in a way that is not captured by the classic conception of information, known as “Shannon Information.”<sup>10</sup> We might say of the content of conscious perception that it is informational *for us*. Tononi suggests that

to measure information integration, it is essential to know whether a system of elements constitute a causally integrated system, or they can be broken down into a number of independent or quasi-independent subsets among which no information can be integrated. (Tononi, 2005, p. 113)<sup>11</sup>

In this quote, Tononi claims that to get anything like conscious content we require not only information but *integrated* information, which we can measure by looking at causal integration. But integration with respect to what? Tononi is inconsistent on this point. It sometimes seems that he wants to measure integration with respect to individual subjects. At other times he describes integration more weakly, as when he says that integration is implicated by the fact that we cannot experience shape without color (Tononi, 2005, p. 112). But the inseparability of shape and color will not tell us whether or not the information is integrated with respect to an individual subject, since these may be integrated with respect to a “quasi-independent subset” of the subject. For integration with respect to an individual subject we would need integration of shape and color with respect to some further thing, outside the processing of any set of elements. Tononi also says that integration is implicated when a “conscious state is experienced as an integrated whole” (Tononi, 2005, p. 112). However, that a *particular experience* is integrated does not tell us whether it is integrated with respect to an individual subject. For this, we would have to know whether possible experiences are integrated together with the current experience. Otherwise the conscious experience of a completely dark room would not yield information through contrast with other possible experiences. I thus suggest that the more plausible understanding of “integration” is Tononi’s first: conscious content is integrated information to the extent that it is information-for-a-subject. Importantly, I am not myself proposing that conscious experience is integrated informa-

tion (as Tononi claims), but only that perceptual content can be defined in such a way.

This proposed understanding of conscious perception, as the experience of integrated information arranged within a space-time framework, raises two connected problems for those with naturalistic leanings.<sup>12</sup> Specifically, assuming that conscious perception is rooted in neural processing and that this requires some degree of structural isomorphism between the two,<sup>13</sup> neural processing must involve a part-whole structure that can support the experience of a unified complex of sensory elements. Problems arise when we note that the processing of sensations does not appear to contain this requisite structure. In order to do so, the processing of sensations would need to be divided into the processing of sensory elements and the processing of sensory elements would have to be held together as part of a unified complex. Explaining the development of the part-whole structure found in perception requires a solution to these twin problems of division and unity.<sup>14</sup>

Importantly, although these problems depend on a naturalistic framework, they need not confuse the content of conscious perception with its vehicles. That is, one can agree

<sup>8</sup> That is, unless privation is intrinsically contentful. If we allow the absence of light to be a type of content outside of the content it derives from contrast with other possible experiences, then this claim does not hold. However, in my understanding, such privations are contentful only in virtue of such contrast.

<sup>9</sup> A possible threat to the idea that a homogenous plane of light has *as much* information as a heterogenous, changing one is that such homogenous experiences are unstable and hallucination-inducing (Knau & Spillman, 1997; Wackermann et al., 2008).

<sup>10</sup> Although “Shannon Information” was first put forward as comprising data without meaning, and thus only part of a full definition of information (Shannon, 1948; Floridi, 2009), since it is now common to call such bare data “information,” I follow the contemporary usage.

<sup>11</sup> Note that Tononi’s use of the term “element” (unlike mine) does not necessarily include participation in a complex as a defining feature.

<sup>12</sup> If I were to characterize my metaphysical commitments, I would probably say that I am a dual-aspect emergentist. That is, I think that mental phenomena are non-reductive but also that experiential phenomena are just one aspect of an underlying substance with two or more aspects, at least one other being externally observable (where emergence occurs in the externally observable aspect(s), also). Although I couch the problems of division and unity within this naturalistic framework, the problems are sometimes discussed outside of such assumptions. However, I cannot make sense of sensation in a non-natural context (i.e. I do not understand what it could mean to be the experiential aspect of mere sensory processing) and so I focus on the naturalistic strategy.

<sup>13</sup> That is, by “is rooted in” I mean to imply a structural correspondence between the two without committing myself to a particular theory of correspondence.

<sup>14</sup> These problems of division and unity can occur at multiple levels, both within and across sets of perceptual elements. I am relying, in part, on Anne Treisman’s seminal treatment of the division and unity of perceptual objects (e.g. Treisman & Gelade (1980)) and am proposing a complementary theory of division and unity that will apply across all the sets of perceptual elements.

with Susan Hurley that “the properties of subpersonal processes, of vehicles of content, cannot simply be projected into personal-level mental content, or vice versa” (Hurley, 2002, p. 3) and still find particular vehicles wanting. As stated, it is the presumption of structural isomorphism, and not a simple projection of properties, that drives the claim that content-vehicles will have to instantiate a part-whole relationship that corresponds to the division and unity of perceptual conscious content.

Burge, mentioned above, claims that the development of perceptual content occurs through perceptual constancies (Burge, 2010, pp. 407-413), but I look further back to the source of these constancies and find a role for the subject through attention.<sup>15</sup> As I will argue below, a solution to the twin problems of division and unity will necessarily involve a global, subjective standard that can only be applied through attention. In other words, I claim that a complete solution to these problems rests in the adoption of the Standard Theory.

### The Standard Theory

The basic claim of the Standard Theory is that attention provides for the structure of conscious perception by transforming unconscious sensations into potentially conscious percepts. Attention performs this feat by prioritizing (and thus differentiating) the sensations according to a global, subjective standard, through which the sensations-turned-percepts are “unified” or integrated, thus solving the problems of division and unity.

To start, let’s return to the claim that conscious perception has division and unity. When I look across my living room, I see many shades of green – in plants, in books, in photographs, and in the house across the street. These parts of my experience share the quality of green-ness. Nonetheless, the instantiations of green are divided in my experience. The specific green of the plant is not confused with the specific green of the book. Thus, there is both a division and a unity of green-ness in my visual experience. Similarly, the sounds of two birds in a nearby tree both have pitch, but the sounds are not confused with one another. Thus, there is both a division and a unity of pitch in my aural experience.

How are these divisions and unities achieved? One might note the common role of space and time. The green of the plant and book are not blended into one another, in part, because these objects are separated in space and time. The sounds of the birds have apparent source locations, which separate them in space and time. But can space and time account for the division and unity found in all perceptual experiences? Against a positive answer, I can perceive two pains without separate spatial and temporal locations. That is, the pains may be experienced as “here” and “now,” as occurring in space-time, without being experienced as having a *location* in the space-time framework. My ability to separate the pains may be based on their different feels and intensities. Perhaps one pain is connected to emotional heartache and the other to the dehydration following alcohol consumption. One can imagine, I think, waking up to these pains without yet localizing them in space and time. If this is correct, then

the space-time framework aids but is not necessary for division and unity.

What, then, can play this role of unifying perceptual experience? A clear common factor in all perceptual experience is the experiencing subject. That is, the parts of my perceptual experience are divided and unified for *me*. When we examine perceptual experience we discover a common pointing back, where the focus of that pointing is the experiencing subject, “me.” This was brought out in in the discussion on Tononi, where “integrated information” was interpreted as “information-for-a-subject.” Another way of putting this is that perceptual experience presents itself as something inseparable from the experiencing subject (without necessarily presenting other knowledge about the subject and what its status is with respect to other subjects).<sup>16</sup> If we want to explain division and unity we should start with this most common factor of “for me”-ness, putting aside issues about the space-time framework and the division and unity at other layers, such as color and pitch.<sup>17</sup>

Whereas perceptual experience is marked by a pointing back to the subject, or a “for me”-ness, the problems of division and unity concern processing outside of perceptual experience that cannot support this pointing back. Namely, the neural processing of sensation does not include interaction between its parts. The processing of color, luminance, and orientation, for example, can occur with little to no interaction between them (see, e.g., Treisman & Gelade (1980)). The neural processing of aural and visual sensations is further separated, despite these having interaction in experience. Assuming the possibility of a natural explanation of conscious perception, some mechanism is required to provide the structure of division and unity that (the neural correlates of) sensations appear to lack. I suggest that this mechanism is attention, where attention divides sensations into perceptual elements by prioritizing them with respect to the global, subjective standard, transforming them into percepts. That is, attention integrates sensations with respect to the global, subjective standard.

The Standard Theory claims that attention allows the merely sensory to become perceptual by differentiating sensations according to a global, subjective standard. So far I have argued that conscious perception has a structure of division and unity not shared by (the neural correlates of) sensation and that this division and unity must take place at the level of the subject. Why think that the subject has to (volitionally or voluntarily) bring about this structure? If the

<sup>15</sup> This need not fall prey to Burge’s criticism of “over-intellectualization” since the subject need only act voluntarily (and not volitionally) and the act of attention need not be based in propositional knowledge nor even conscious experience.

<sup>16</sup> This point is famously brought out in Descartes’ work and imperfectly contested in Hume’s, as is nicely discussed in Justin Broackes’ essay, “Hume, Belief, and Personal Identity” (Broackes, 2002, p. 200).

<sup>17</sup> This move constitutes a departure from Anne Treisman’s Feature Integration Theory, where attention is strongly linked to the common spatial framework and where binding is only described with respect to single objects, and not across the perceptual field.

subject is not required to bring about this structure then the structure would not rely on the act of attention, since pre-subjective processes could do the dividing work in that case. The requirement for self-determined transformation in the case of conscious perception can be seen by looking at the variation between perceivers. For two perceivers watching someone bike past, one may perceive the color of the bike but not the clothing of the cyclist while the other perceives the color of the cyclist's clothing but not that of the bike. Presuming that these two perceivers had the same sensory information available to them and that the difference between their experiences is not random, this shows that something (causally) internal to the perceivers is determining what they do and do not perceive. That is, disparities in which stimuli are seen reveal that such stimuli do not (on their own) determine whether or not an observer perceives them. One could go further and take the very same perceiver in different circumstances and show that they perceive different stimuli (depending, perhaps, on the task they are currently undertaking), demonstrating that the difference between the cases is neither stimulus-based nor due to pre-subjective processing. Cases like these reveal the need for a self-determined boundary between the pre-subjective and the subject level.

To understand what it could mean to have a self-determined boundary, I favor the use of an analogy to digestion. The differentiation and integration of sensory processing that is purported by the Standard Theory to be provided by the act of attention is relevantly similar to the incorporation of nutrients into the body that occurs in the process of digestion. When I digest peanut butter, the peanut butter is (eventually) transformed into parts of my body. How is this accomplished? The process of digestion shares some similarities with the (relatively automatic) process of turning light into plant cells for a plant: just as the light is taken in by the plant, the peanut butter is taken in by my body. But unlike plants, bodies have considerable (intra-species) variation in what they will allow to be incorporated. My friend Colin, for instance, has an immune system that rejects peanut butter. The (non-genetically-determined) rejection of peanut butter by Colin's immune system reveals a self-organization that is not present in plants.<sup>18</sup> That is, it reveals a self-governed determination of what will be incorporated by the body which is of a higher-order than genetic rejection (e.g. from Celiac disease) but of a lower-order than personal rejection (e.g. from disgust). My claim is that just as the immune system (partially) determines what will be incorporated into the body, the subject (partially) determines what will be integrated from the mind into the subject level. In other words, just as the boundary between the body and the non-body is internally regulated (by the immune system), the boundary between the subjective and the pre-subjective is internally regulated (by the subject). This boundary is the very complement to unity: the unity shared by perceptual elements implies a disunity between those elements and all other existing things. The consumption model that I have detailed so far is necessary because of this internal/external boundary that limits the subjective space of the mind together with the observation that the boundary is internally maintained.<sup>19</sup>

If these observations are correct, the integration of sensation to conscious percept requires the (weak) volition of the subject (i.e. it requires that the process is within the subject's control), so we know that it will have to be a subject-level act. However, integration also has features that we do not find in incorporation or consumption. Unlike the peanut butter that becomes a part of my body by simply being allowed to stay within the physical confines of my body (or by being "incorporated"), sensation is *integrated* as *information* for the subject. That is, the consumption model gives us an account of how something might be incorporated by a self-organizing power, like the subject, but not an account of how the incorporated items become differentiated with respect to the subject, or become information-for-a-subject. Thus, anything in the subjective space must not only be incorporated but also differentiated with respect to the subject. This, I claim, is the role of the prioritization work of attention. The role of attention in differentiating and the role of the subject in integrating are linked in the Standard Theory: the subject holds the global standard of integration with respect to which attention differentiates.

For something to be information-for-a-subject the subject must hold the standard of comparison for the information being integrated. That is, the differentiated parts will have to point back to the subject according to a global, subjective standard, otherwise the information will not be integrated or unified with respect to the subject. Further, the subject will have to be the source of this integration to satisfy the observation that the boundary between the pre-subjective and the subject level is internally regulated. Attention, I claim, is best understood as subject-level prioritization, where it will not matter for my purposes whether the subject is the actual mover of the activity of prioritization or whether the subject is like Confucius' "pole star," which simply stands still in voluntary acceptance while the elements point back to it.<sup>20</sup> Either way, the differentiation work of prioritization must take place in accordance with a global standard held by the subject in order to achieve integration at that level. Thus, for the subject to differentiate those items it integrates, it will have to use subject-level prioritization or what I have called "attention."

The story so far supplies only the most universal and basic form of integrated information. But the conscious perception of most humans has further layers of division and unity. It is the division and unity of these further layers, I claim, that requires a common spatio-temporal framework.

Returning to an example used at the start of this section, there is a division and unity of green-ness in my visual

<sup>18</sup> That is, as far as I know it is not present in plants. I make this claim only to illustrate what is true about digestion, which does not hang on the truth or falsity of self-organization being absent in plants.

<sup>19</sup> I take it that non-consumption models of content, such as Dretske's magnetosomes (Dretske, 1993), do not have the integration required for their "information" to count as content.

<sup>20</sup> "The Master said, 'He who exercises government by means of his virtue may be compared to the north polar star, which keeps its place and all the stars turn towards it.'" (Confucius, 2007, p. xi).

field. How might this occur? My suggestion is that it occurs through the pre-subjective prioritization of sensory processing according to goals that reliably fit the global, subjective standard. That is, for stable subject-environment couplings it may be the case that the processing of sensations becomes tuned to goals that can reliably bring about value according to the global, subjective standard. Groups of neurons may become tuned, for example, to the inputs that normally enable the realization of subjective value and respond preferentially to them. Thus, “feature maps,” or maps of sensory inputs according to pre-subjective standards that regularly contribute to the global, subjective standard, will take place without attention for long-term goals. This explains how it is that certain features of stimuli are pre-subjectively prioritized by the visual cortex – the inheritance of neural tuning created by millennia of other subjects matching goals like ours to a world like ours does much of the dividing work for us. Thus, one need not find attention necessary for each instance of division and unity, such as the division and unity of individual feature sets, but only for the unity found across perceptual experiences.<sup>21</sup>

To achieve unity across multiple feature maps it will be necessary to have a framework on which to track the values of those maps. That is, the application of a unifying standard to multiple sets of feature values will require a structure through which to compare the values of each set without losing the internal structure of each set. This is the role of the common spatio-temporal framework found in nearly all perceptual experience. A common spatio-temporal framework is required so that the prioritizations found in the feature maps can be compared with respect to the subjective standard without losing the particular information contained in those feature maps. This common spatial framework need only be general enough to combine all the feature sets, and not so general as absolute or allocentric space-time. In such a system the different feature dimensions will share a framework or matrix that allows for prioritization across dimensions but that sacrifices neither the saliency values contained in each dimension nor the spatio-temporal location values of the information sources. This spatio-temporal framework helps us to solve the problem of subject-level unity in that it provides a mechanism of comparison for the application of a unifying standard. The accuracy yielded by egocentric spatio-temporal coding in the parietal cortex (as discussed by Robertson (2003)) also fits with this model: the common spatio-temporal framework will rely on egocentric information about the movement of the sensory organs to map the sensory data accurately through space and time. Even once we have a framework for comparison, though, we will still need attention to match the values from pre-subjective standards to the subjective standard to obtain subject-level unity.

Support for the Standard Theory comes from perceptual experience itself: perceptual experience normally has the structure of theme to thematic field, or foreground to background, as was pointed out by Aron Gurwitsch in his *Field of Consciousness* (Gurwitsch, 1964).<sup>22</sup> That is, perceptual experience normally contains a foreground of experience (the theme) that is delimited by contrast with its background (its

thematic field), where the separation between foreground and background can be as rough-grained as that between two different sensory modalities. In “*ganzfeld*” experiences, for example, where a single modality contains only homogenous sensory information, that modality is yet experienced as being the foreground to the other sense modalities. Even in Balint’s syndrome, where a patient with bilateral parietal lesions only recognizes one object at a time, that object is reported to be experienced against a background that serves as a contextual basis for that object (Michel & Henaff, 2004, p.11). It is a strict result of prioritization against the global, subjective standard that a single theme will emerge for the perceiving subject at any given time (that one set of perceptual elements will emerge as having the highest priority for the subject). This theme may be an object, a type of motion, or some other set of perceptual elements. If there are cases of perceptual experience of a theme *without* a thematic field, I suspect that the theme will yet be experienced as informational for the subject. In that case, the residual structure of integrated information will still call for the prioritization work of attention in order for that theme to serve as perceptual content.

According to the Standard Theory, all perceptual experience minimally contains the structure yielded by prioritization with respect to the global, subjective standard, even if it does not also contain other layers of prioritization that need to be fitted to a common spatio-temporal framework. Thus, although the provisional definition of conscious perception supplied at the start of this paper involved the experience of sensory elements bound to spatio-temporal structure, the Standard Theory does not depend on this limited understanding of conscious perception to make its case. Any type of unified content, where unity is understood relative to the subject, will rely on attention, according to the Standard Theory.

## Conclusion

Throughout this paper I have illustrated how the content of conscious perception relies upon attention. I have claimed that although the process of division and unity for individual feature-sets can be automatized, such that neural structures can become tuned to particular types of features and collections of features according to the long-term goals of the subject, unity across features will only be achieved with the real-time application of the global, subjective standard through attention. Thus, if the Standard Theory is correct, attention is necessary for conscious perception as we know it, which minimally involves integrated information and which normally results in both a division of theme from thematic field and in deeper layers of division and unity.

The Standard Theory fits into a line of thinking that considers conscious perception the first step toward knowledge.

<sup>21</sup> This roughly corresponds with the “master map” model that Treisman offers (Treisman, 1998).

<sup>22</sup> I thus use Gurwitsch’s terms “theme” and “thematic field” (Gurwitsch, 1964, 1985).

As is previously mentioned in this paper, James says that attention shapes our experience and provides it with “intelligible perspective.” So, too, Merleau-Ponty finds that attention brings the unknown into the realm of the knowable. The Standard Theory likewise holds that attention allows the subject to grasp its object by bringing that object into the space of the subject, or into the subject level.

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