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Tropes, Universals, and Visual Phenomenology

Philosophers of perception who believe that visual states are representations usually also accept that visual states present that some properties are instantiated. However, a proper philosophical account of such "visual properties" is lacking. An important question concerns whether visual properties should be characterized as universals, i.e. as properties that can be instantiated multiple times, or as tropes, i.e. individualized properties that are not multiply instantiable.

While some philosophers adopt an agnostic stance towards this issue (e.g., Siegel 2010, pp. 58–59), in recent decades various authors have developed arguments aiming to show that visual properties should be characterized as tropes (Lowe 1998, 2008; Mulligan 1999; Nanay 2012). One argument for the trope interpretation, which will be the focus of this paper, is the claim that the way in which we visually experience properties makes it plausible to characterize them as tropes. For instance, it has been stated that when visually experiencing an object as having a property, we are not phenomenally presented with a relation of instantiation between an universal and an object (Mulligan et al. 1984), and that the perceptual phenomenon of visual-property constancy provides a reason to accept the trope interpretation of visual properties (Almäng 2016).

In this paper, I argue for a different position, namely that the way in which we visually experience properties provides a serious challenge for the trope interpretation but not for an interpretation in terms of universals. More specifically, I claim that trope interpretations of visual properties have problems with providing a plausible explanation of the fact that ordinary, veridical visual experiences can present the properties of two objects as strictly similar (e.g., we may experience two items as being exactly the same in terms of color).

It should be noted that I focus here solely on relations between the trope interpretation of visual properties and the phenomenology of visual experiences. The presented arguments do not imply that there is no other, non-phenomenal way of arguing in favor of trope interpretation (for instance, see Almäng 2013; Nanay 2012). Furthermore, it may be the case that more general, metaphysical considerations will show that no properties can be universals (e.g., because universals lead to Bradley's regress, Maurin 2010) or that no properties can be tropes (see Armstrong 1978a, pp. 86–87). If this is the case, then visual properties cannot be universals or tropes. However, in this paper I do not engage in this more general discussion; I only consider whether there is something specific in how properties are visually experienced that suggests that they should be treated as tropes or as universals.

In conducting my investigations, I rely on three assumptions. First, I assume that visual experiences present objects as having properties. While this is a common assumption of both trope and universal interpretations of visual properties, there are also possible strictly nominalistic approaches to visual experiences that do not characterize visual content in terms of properties – though discussing these goes beyond the scope of this paper. Second, I treat visual objects and visual properties as two separate categories that cannot be reduced to one another. In consequence, visual objects are not interpreted as bundles of properties but as individuals that possess properties (see Bacon 1995; Campbell 1990). Analogously (see Oliver 1996, 21–25), visual properties are not identified with sets of similar objects but are

understood as entities that are possessed by objects (however, see section 6 for a comment concerning this proposal). This seems to be the dominant view in the contemporary literature concerning the philosophy of visual perception (e.g., Cohen 2004; Matthen 2004; O'Callaghan 2008) and is also accepted by the main proponents of the trope interpretation of visual properties (see Lowe 2008; Mulligan 1999; Nanay 2012). Third, I assume that in genuine trope theories, tropes cannot be reduced to combinations of non-trope entities (see Campbell 1999, pp. 68–71; Ehring 2011, pp. 175–187; Maurin 2002, pp. 10–15; Moreland 2001, pp. 64–67 for arguments against the reductive notions of tropes). In particular, tropes should not be composed solely of universals.

The paper starts by explicating the distinction between tropes and universals (section 1). Subsequently (section 2), I present the Indiscernibility Challenge, which poses a serious problem for the trope interpretation of visual properties but not for the universal interpretation. Various potential responses to the challenge available to proponents of a trope interpretation are considered, and I argue that none are successful because either they cannot account for all relevant characteristics of visual phenomenology or they lead to a reductive notion of tropes in which tropes are composed solely of universals (sections 3–6). Further, in section 7, it is argued that a universal interpretation does not face a problem analogous to the Indiscernibility Challenge and the usual arguments against the universal interpretation, referring to the way in which properties are visually experienced, do not constitute a serious threat.

1. Tropes and universals

In the field of analytic metaphysics there are several influential approaches to distinguishing universals from particular trope-properties. Probably the most popular consist

in postulating that universals, but not particulars, have the ability to be wholly multiply instantiated (e.g., Lowe 2006, 114–115; Moreland 2001, 3–4). For instance, if a shade of red is a universal property, it can be instantiated by more than one object (e.g., by a red ball and a red car). In addition, it does not seem to be the case that a shade of red is composed of two parts, one instantiated by a ball and a second instantiated by a car. It is rather the case that whole redness is instantiated by each of these objects. On the other hand, if a shade of red is a trope, then it cannot be possessed by two distinct objects. In such a case, the color property of a red ball may be strictly similar to the color property of a red car, but despite such similarity, the color-property of the first object is numerically distinct from the color-property of the second object. Furthermore, if being instantiated entails being spatially localized, it is possible for a universal property to exist in many disjoint places (Daly 1994; Heil 2003, 132–136; Schaffer 2001). It should be noted that the ability to be wholly multiply instantiated is a modal notion, so it is possible for a universal to be instantiated by only object.

While characterization of particularity in terms of the ability to be multiply instantiated has gained significant popularity, it is not universally accepted. There are authors who claim that in certain cases tropes can be instantiated more than once or that there are universals that cannot be multiply instantiated. For example, Ehring accepts the possibility of a trope travelling back in time and meeting itself at some moment (Ehring 2011, 28–30), while MacBride (1998) argues that universals such as "being the uniquely highest charged point particle in the cosmos" can have only one instantiation. Because of such problems, an alternative distinction has been proposed that distinguishes universals from tropes in virtue of a relation between indiscernibility and numeric identity (Ehring 2004, 2011). It is proposed that in case of universals indiscernibility, understood as having the same intrinsic (i.e., non-relational) properties is sufficient for numeric identity. According to this approach, assuming that color-properties are universals, if a ball has a certain shade of red and a car has an

indiscernible shade of red, then the color-property of the ball is numerically identical to the color-property of the car. On the other hand, the analogous inference does not occur in the case of tropes. In this case, if color-properties are particulars, their strict similarity does not entail numeric identity.

The two above approaches are logically independent in the sense that the acceptance of one of them does not entail acceptance of the other. For instance, one may claim that properties are universals due to their ability to be multiply instantiated while postulating that there exist universals that are numerically distinct despite being strictly similar (see Rodriguez-Pereyra 2017). Analogously, it can be accepted that in the case of tropes, qualitative sameness does not entail identity without making any commitment to the idea of multiple instantiation. Because of this independence, and the fact that philosophers still debate which of the described approaches is the most accurate (see Giberman 2016), for the purpose of this paper I adopt the following disjunctive characterization of the trope interpretation of visual properties:

(Trope interpretation) *Visual properties are tropes if and only if (a) they cannot be wholly multiply instantiated by distinct objects or (b) they can be strictly similar without being identical.*

In contrast, the universal interpretation of visual properties is characterized conjunctively: visual properties are universals if and only if (a) they have the ability to be wholly multiply instantiated by distinct objects, and (b) their strict similarity entails identity.

In the next section, I argue that the trope interpretation faces a serious challenge in accounting for the phenomenology of visual experiences. On the other hand, the presented challenge does not affect the universal interpretation of visual properties.

2. Indiscernibility Challenge

It seems certainly possible that we may visually experience two objects, positioned in disjoint locations, as simultaneously having strictly similar properties. For instance, we may perceive two spatially separated circles as having qualitatively the same shade of red, such that we do not experience the redness of one object as in any way different from the redness of the second. Such experiences can be generated by a normally functioning perceptual system, may happen in everyday situations, and do not seem to be any more inaccurate than other usual visual experiences. I believe that the presence of such experiences poses a challenge for those trope interpretations of visual properties that postulate that the way in which we phenomenally experience properties supports the thesis that visual properties are tropes. I name this challenge the Indiscernibility Challenge[1]:

(Indiscernibility Challenge) *Ordinary, accurate visual experiences can present two objects, positioned at disjoint locations, such that a property of the first object is strictly similar to a property of the second object.*

To see why the Indiscernibility Challenge possesses a problem for the trope interpretation of visual properties, but not for the universal interpretation, let's distinguish two aspects of visual properties. The first is the 'qualitative aspect,' which determines how similar

[1] An analogous challenge can be formulated for qualitatively identical objects in order to evaluate theories of individual objects. For instance, one may argue that bundle theories of objects may be preferred as theories of visual objects as they do not account for particularity of objects by introducing some non-qualitative elements which do not correspond to what is phenomenally presented. However, the problem goes beyond the scope of this paper.

a property *F* is to a property *G*. Strict similarity is the highest possible level of similarity. The second is the 'individuative aspect,' which determines whether a property *F* is identical to a property *G* (see Almäng 2016 for a source of this distinction). In response to the Indiscernibility Challenge, a proponent of the universal interpretation may simply identify the qualitative aspect, such as 'being a certain shade of red,' with the individuative aspect. In this case, if a property of one object is strictly similar to a property of a distinct object, then the property of the first object is also identical to the property of the second. Because of this, situations described by the Indiscernibility Challenge are consistent with claims crucial for the universal interpretation: visual properties can be wholly multiply instantiated and their strict similarity entails identity.

On the other hand, the same strategy is unavailable to a proponent of the trope interpretation who maintains that visual phenomenology supports the trope status of visual properties. In order to defend a disjunctive claim that visual properties cannot be wholly, multiply instantiated or that strict similarity does not entail identity, the individuative aspect cannot be simply identified with the qualitative aspect such as 'being a certain shade of red'. In consequence, the trope interpretation faces the problem of how to justify, relying on visual phenomenology, the numeric difference between properties of distinct objects that are accurately experienced as being strictly similar. This problem is a special case of a more general, metaphysical challenge of explaining in virtue of what strictly similar tropes are distinct. However, in the context of the Indiscernibility Challenge an additional constraint has to be satisfied: that the proposed explanation of tropes' distinctiveness has to be supported by the way in which properties are perceptually experienced. Thus, some metaphysical conceptions of tropes' distinctiveness may not be available as proper answers to the Indiscernibility Challenge.

Below, I describe strategies that a proponent of the trope interpretation may adopt in order to accommodate the Indiscernibility Challenge. I argue that all of them imply some problematic consequences which make them less plausible than the interpretation in terms of universals.

3. Refuting the challenge

A proponent of the trope interpretation of visual properties may claim that, contrary to the initial intuition, there are no visual experiences that lead to the Indiscernibility Challenge. In particular, it may be postulated that in fact we never perceptually experience the properties of two objects as being strictly similar. While a person may report that features of two objects are indistinguishable, such a report could be a result of postperceptual reasoning in which minute phenomenal differences are neglected. Alternatively, the limitations of visual working memory may mean that, when the features of two objects are compared, some tiny differences are not recognized and reported. If this is the case, then one can maintain that the way in which visual properties are experienced does not support attributing to them an ability to be wholly and multiply instantiated. Even if the qualitative aspect of visual properties is identical to the individuative aspect, the properties of two objects are never simultaneously experienced as being strictly similar.

However, the general claim that there are no visual experiences presenting properties as being strictly similar is hardly justified if one accepts a mainstream naturalistic picture of perception and phenomenal character. According to such a general naturalistic view, the phenomenal character of perceptual states supervenes on activities of the neural system. If this is the case, then differences in how features are visually experienced may arise from differences in the stimuli affecting the perceptual mechanism or from differences in how these

mechanisms process the incoming data (for instance, focusing attention may modify the experiential parameters of the observed color, see Carrasco and Barbot 2019). Nevertheless, it seems certainly possible to arrange the visual scene in such a way that the light reflected from two objects will deliver the same information, relevant for color perception, to the visual system. Furthermore, it is possible for the human visual system to represent several objects at a single moment (see Scholl 2007) and if such objects are positioned in proximity they can be simultaneously attended to (e.g., Cavanagh and Alvarez 2005). In consequence, it is unlikely that information regarding features such as color will be processed differently. Because of this, there is no reason to suppose that it is impossible for a human visual system to simultaneously present a feature of one object as being strictly similar to a feature of a second object even if in practice such experiences may be rarer than suggested by our initial intuition. Furthermore, situations in which the visual system attributes an equal amount of attentional resources to two objects and gathers the same color-related information from each are examples of normal visual perception and there is no justification for claiming that the perception of properties in such cases is in some way illusory.

4. Complex tropes

The main division within trope theories of properties is that between theories which treat tropes as complex and those which treat them as simple entities (for instance, see Alvardao 2019; Daly 1994; Ehring 2011, pp. 175–187; Maurin 2002, pp. 10–15). According to theories of complex tropes, such entities are composed of some more basic elements, which is not the case according to simple tropes theories. I start by investigating the responses to the Indiscernibility Challenge available for complex tropes theories and then consider theories of simple tropes. I believe that a proponent of complex tropes has three ways of responding to

the Indiscernibility Challenge: (a) by identifying the individuative aspect of properties with their relational aspect, (b) by treating the individuative aspect of properties as equal to the combination of their relational and qualitative aspects, and (c) by postulating a primitive individuative aspect.

4.1 Individuation by relational aspect

Properties are not only visually experienced as having some qualitative aspect, like a specific shade of red, but also as being related to some objects or places. In normal visual experiences, properties are presented as possessed by some individuals or as characterizing some spatial regions. A proponent of the trope interpretation of visual properties may attempt to utilize this fact in order to justify the numeric distinctiveness between properties experienced as strictly similar. One way to spell out this observation is to postulate that visual properties are complex entities composed of two elements: a qualitative aspect determining their similarity and a relational aspect determining the individuals by which the properties are instantiated.

To illustrate this option, let's consider a visual experience presenting two objects, *a*, with the property *F*, and *b*, with the strictly similar property *G*. Properties *F* and *G* have the same qualitative aspect in virtue of which they are strictly similar. Furthermore, they also have relational aspects determining their relations to individuals: the property *F* stands in a relation to the object *a*, while the property *G* is related to the object *b*. To justify the claim that property *F* is not identical to property *G*, a proponent of the trope interpretation may simply claim that the relational aspect of properties is their individuative aspect. In consequence, because *F* and *G* have different relational aspects, they are also distinct properties. However, such a simple proposal cannot be accepted. This is because an object can be visually experienced as having several properties, for instance an object can be experienced as being

red and circular. However, in this case the relational aspect of an object's redness and circularity will be the same and so, if the relational aspect is equated with the individuative aspect, the circularity of an object will be wrongly treated as identical to its redness.

4.2 Individuation by a sum of relational and qualitative aspects

A more promising route is to postulate that the individuative aspect of a visual property is determined by both the qualitative and the relational aspect. This option allows us to state that the indistinguishable properties, *F* of the object *a* and *G* of the object *b*, are distinct because the relational elements of their individuating aspects are different, and also to maintain that the circularity of an object is distinct from its redness, as in this case the qualitative elements of their individuating aspects are distinct. Nevertheless, the proposal that treats visual properties as combinations of qualitative and relational aspects entails a reductive notion of tropes according to which tropes are identical to combinations of elements that have characteristics typical of universals.

To demonstrate this, let's once again consider an experience in which the object *a* is *F* and the object *b* is *G*. According to the proposed trope interpretation, *F* is distinct from *G* because the individuative aspect of *F* is composed of the qualitative aspect *Q* and relational aspect *R*, while the individuative aspect of *G* is composed of the same qualitative aspect *Q* but a different relational aspect, *S*. In consequence, the qualitative aspect *Q* is something that simultaneously and wholly constitutes two distinct entities: properties *F* and *G*.[2] The same

[2] It should be noted that there exist cases in which an element wholly and simultaneously constitutes two entities but should not be characterized as a universal. In particular, two material objects may spatially overlap and thus share the same space (see Chrudzimski 2002). However, this complication does not occur in the case of the Indiscernible Challenge as the considered strictly similar visual properties share their qualitative aspect without any spatial overlap.

characteristics relevant for being universals are applicable to relational aspects *R* and *S*. For instance, the object *a* may also simultaneously possess another property *K*, distinct from *F*. In this case, properties *K* and *F* are composed of distinct qualitative aspects but by the same relational aspect *R*. In consequence, relational aspects also have the ability to wholly and simultaneously compose two distinct entities: properties *F* and *K*.[3] Because of this, the proposed trope interpretation of visual properties as composed of qualitative and relational aspects is committed to the reductive account of tropes according to which visual properties are composed solely of universals.

An attempt to avoid the above consequence could be to claim that while the relational aspect partially determines the individuative aspect, it is not a relational universal. This proposal can have three forms: (a) a relational aspect is not a universal but a relational trope (see Maurin 2010); (b) a relational aspect is a universal but not a relation, as it is some 'non-relational tie' (see Armstrong 1997, p. 30); and (c) a relational aspect is a relation but it is an internal relation which necessarily combines only some specific entities (see Robb 2005).

Accepting the first option entails that a visual property is composed of a universal qualitative aspect and a particular relational aspect. This reintroduces the general problem, as now the question of what individuates relational tropes and whether visual phenomenology in any way justifies their mode of individuation can be asked again. It should be noted that this consequence is associated not only with theories postulating relational tropes, but with all theories which postulate that a trope has a particular aspect (e.g., that the qualitative aspect is particular while the relational aspect is universal or that both aspects are particular). According to such positions, a complex trope is composed of further, second-order tropes

[3] Even if the relational aspect would include not only a relation to an object but also a spatial relation to a place in which a property is positioned, and spatial relations to all other perceived properties, it would still be universal. It is so because properties with different qualitative aspects may overlap (e.g., a color property and a texture property) and have the exact same spatial characteristics.

which may also be complex or be simple. If they are complex, then theories of their individualization are equally problematic as those concerning first-order complex tropes (described in section 4). On the other hand, if they are simple, they are threatened by difficulties characterized in section 5.

The second option is also unsuccessful because it still leads to a reductive account of tropes. According to this account, tropes are composed only of two universals—corresponding to the qualitative aspect and the relational aspect, even if the relational aspect is not in fact a relation.

The third option postulates that a relation between a visual property and an object is internal. A relation is internal for some entities if and only if their joint existence is sufficient for their standing in a given relation. For instance, if a relation *R* between an object *A* and a trope *T* is internal, then *T* stands in *R* to *A* if only *T* and *A* jointly exist. In other words, it cannot be the case that *A* and *T* exist at the same moment without standing in *R*. It is often accepted that when entities are combined by an internal relation, there is no need to introduce an additional, relating entity such as a relational trope or universal (see Armstrong 1997, p. 12). Instead, the intrinsic nature of the combined elements is such that they cannot jointly exist without being related. Nevertheless, postulating that relational aspect of a visual property has the status of an internal relation is not enough to answer the Indiscernibility Challenge. It is so because a question arises in virtue of what a visual property is such that it is internally related to some particular object, for instance an object *A* and not an object *B*. One possible answer is that the object to which a trope is internally related is determined by some primitive, nonqualitative aspect of a trope. A second possible answer is that the qualitative aspect of a property determines the object to which a property is internally related. I believe that both these options face severe problems; in section 4.3 I argue against

introducing primitive aspects of visual properties and in section 5 I discuss positions which introduce a reference to objects in the qualitative aspect of visual properties.

4.3 Primitive individuation

A common proposition in the metaphysical trope theories of properties is that the numeric distinctiveness of strictly similar properties is a primitive fact that cannot be further analyzed (e.g., Campbell 1990, pp. 68-70; Maurin 2010). In the case of theories characterizing tropes as complex entities, it would mean that tropes are composed of two elements: the qualitative aspect and a primitive, individuative aspect. In consequence, it is possible for a property *F* to share its qualitative aspect with a property *G*, and so for *F* and *G* to be strictly similar, but *F* is still numerically distinct from *G* as they have different primitive individuative aspects.

However, such theories are not well-suited for responding to the Indiscernibility Challenge. This is because nothing in the phenomenal character of visual experiences corresponds to the primitive individuative aspect. Properties are not visually distinguished by perceiving that they are 'simply distinct' in a primitive way but by differences in their qualities (like in case of differ shades of a color) or by differences in how properties are related to objects or places. Because of this, if one believes that trope-status of visual properties is supported by visual phenomenology, then a different account of trope-individuality should be adopted.

A proponent of primitively individuated tropes may postulate that this problem can be avoided by distinguishing the individuation of tropes from their identification (see Campbell 1999, pp. 68–71 for such a distinction). Tropes are individuated primitively, and so their individuative aspect is not reflected in the phenomenal character of visual experiences. But they can be perceptually identified, and discerned, for instance, by their varying spatial

characteristics and relations to objects. However, such an answer already entails that the ontological structure of tropes is not supported by the way in which visual properties are perceptually experiences. Tropes have a primitive individuative aspect, however, this aspect is not justified by any element of visual phenomenology and so must be justified by some other means that do not rely on the way in which visual properties are experienced.

An alternative, interesting counterargument is to postulate that the ability to perceptually, demonstratively refer to indistinguishable properties provides support for a thesis that visual properties are primitively individuated. Usually, perceptual demonstrative reference is understood in terms of attentional focus (e.g., Campbell 2002; Montague 2011). For instance, when perceiving two indistinguishable red patches, we may, despite their qualitative sameness, focus attention on *this* patch or *that* patch. Nevertheless, there are two problems connected with the idea that such demonstrative reference supports primitive individuation of visual properties. First, it is likely that the possibility of perceptual demonstrative reference already presupposes a distinct, non-primitive mode of individuation. For instance, we may perceptually refer to *this* red patch because it is experienced as positioned in a distinct place or as instantiated by an object distinct from other indistinguishable red patches. If such differences were not present and two red patches were completely overlapping, there would be no possibility to demonstratively and perceptually refer to each of them separately. In consequence, it may be doubtful whether the possibility of perceptual demonstrative reference supports primitive individuation as it seems to assume some distinct mode of individuation.

Second, according to mainstream characterizations (see Scholl 2001 for review), visual attention is either object-based or space-based. This means that focusing attention on a property involves focusing it on a place in which property is located or on an object which possesses it. Thus, a perceptual demonstrative reference made in virtue of attentional focus

does not simply pick out a property but rather a complex entity: a property together with its place or object. This again suggests that perceptual demonstrative reference does not support primitive individuation, as demonstratively selected elements do not differ primitively but due to their distinct constituents. For example, when perceptually referring to *this* red patch an entity composed of a redness property and an object *A* is picked out, while when perceptually referring to *that* red patch an entity composed of a redness property and an object *B* is selected.

5. Simple tropes

Contrary to the theories characterizing tropes as complex entities, theories of simple tropes deny that tropes are composed of some more basic elements (see Campbell 1990, pp. 68-70; Maurin 2010; Williams 1953). In consequence, such theories cannot postulate that tropes are constituted by two distinct aspects, qualitative and individuative. Instead, the qualitative aspect must be identical to the individuative aspect, and a trope itself is identical to this single aspect. Thus, a proponent of simple tropes has two ways of responding to the Indiscernibility Challenge: (a) by postulating that properties are individuated by primitive differences of their qualitative aspects, and (b) by postulating that properties are individuated by qualitative differences of their qualitative aspects.

The first proposal is threatened by the same problem that arises when postulating the presence of a primitive individuative aspect within the structure of complex tropes. No element of visual phenomenal character seems to suggest that properties are primitively individuated. Instead, properties are visually distinguished by their qualities or relations between them and other elements of the visual field.

The second approach cannot consist in postulating that individuative aspect of visual properties is identical to their narrow qualitative aspect such as "shade of red R". In this case visual properties would be universals: a shade of red R property of an object *a* would be identical to a shade of red R property of a distinct object *b*. However, there is an alternative way of characterizing qualitative aspect according to which the relational aspect of visual properties is not separate from the qualitative aspect but in fact is included within it. In this case, the qualitative aspect of a red-color property of an object *a* is not simply a certain shade of red but a certain *shade* of red possessed by object *a* (see Lowe 2006 for a theory in which tropes are individuated by objects that possess them). Relying on such an extended notion of the qualitative aspect, a proponent of the trope interpretation is able to refute the Indiscernibility Challenge. For instance, if one visually experiences an object on the left as having a certain shade of red and an object on the right as having indistinguishable shade of red, it does not follow that the color-property of the first object is experienced as being strictly similar to the color-property of the second. The color-property of the object on the left is experienced as "shade of red R possessed by the object on the left" and the color-property of the object on the right is experienced as "shade of red R possessed by the object on the right". In consequence, it seems that the way in which vision phenomenally presents properties supports the claim that visual properties cannot be multiply instantiated. This is because each of the simultaneously experienced properties will be experienced in a unique way, determined by the extended qualitative aspect – including the narrow qualitative character of a property (like "shade of red R") and the relation to an object (like "possessed by the object on the right").

Nevertheless, I believe that such a solution is unsuccessful, as there are reasons to believe that vision does not usually present visual properties as having extended qualitative aspects. Let's consider again a situation in which one experiences an object *a* on the left with

a redness-property *F* and an object *b* on the right with a redness-property *G*. According to a proponent of the extended qualitative aspect of visual properties, the property *F* has a qualitative aspect "redness possessed by object *a*," while *G* is a distinct property because it has a different qualitative aspect, namely "redness possessed by object *b*".

Let's now imagine that objects *a* and *b* swap places through a continuous motion. It is well-recognized in cognitive psychology that if an object moves in a spatiotemporally coherent way, the visual system represents that the object at the end of the motion is the same as the one that started moving (see Scholl 2007). Because of this, after position-swapping it will be visually experienced that now object *b* is on the left while object *a* is on the right. In consequence, the property with the extended qualitative aspect "redness possessed by object *a*" will now be positioned in the right part of the visual field while the property with the qualitative aspect "redness possessed by object *b*" will be now positioned in the left part of the visual field. Because qualitative aspects determine the perceived similarities between properties, the position-swapping between *a* and *b* should cause a phenomenal difference in color-properties perception. However, the experience presenting that object *a* is on the left and object *b* is on the right and the experience presenting that object *b* is on the left and the object *a* is on right do not differ at all in terms of how the distribution of color-properties is experienced. In other words, the phenomenal differences implied by the notion of extended qualitative aspect do not find support in how properties are visually experienced.

An alternative variant of the same idea is to postulate that the extended qualitative aspect of visual properties does not contain a reference to an individual instantiating a property but to a place in which a property is located (see Shaffer 2001 for an account of trope individuation by localization). In this case, the example of the qualitative aspect would not be "shade of red *R* possessed by the object *b*" bur rather "shade of red R located in place *p*". However, such a proposal renders visual properties extremely volatile. If visual properties are

individuated by such an extended qualitative aspect, then each modification of a location replaces a property with a numerically and qualitatively distinct one. This result is not consistent with the consensus regarding the ability to represent property constancy by human vision (e.g., Cohen 2015; Shebilske and Peters 1996). In particular, we are able to recognize that the visual property remains the same despite various phenomenal modifications related, *inter alia*, to changing luminance, and spatial factors connected with distance or perspective.[4] For instance, a surface can be experienced as being white both in the bright midday light and during evening. Because of that it seems unlikely that every modification of spatial properties leads to a perception as of a distinct property. An analogous problem is faced by a solution according to which spatial characteristics included within an extended qualitative aspect concern the relative position of a property to other simultaneously perceived strictly similar properties such that the qualitative aspect can be described in a manner similar to "shade of red R in a spatial relation S_1 to property P_1 and … and in a spatial relation S_n to property P_n". In this case, any modification of spatial characteristics of any of the strictly similar properties in fact replaces all those strictly similar properties with their numerically and qualitatively distinct counterparts. It is so because according to this approach, every relation to every other strictly similar property is included in a property's qualitative aspect. In consequence, the way in which visual properties are perceptually presented does not support the view that they are individuated by an extended qualitative aspect including a reference to spatial characteristics.

6. Type-token distinction and sets of tropes

[4] The phenomenon of property constancy may also cause a problem for the universal interpretation of visual properties. See section 7.1 for my response.

When discussing theories of complex and simple tropes, I treated the qualitative and individuative aspects as constituents of tropes. However, there is an alternative way of conceptualizing the complexity of tropes made in terms of the type-token distinction (such idea seem to be presented in Almäng 2016). According to this approach, a particular redness trope is a token of a universal redness type. Strictly similar tropes are qualitatively the same due to being tokens of the same universal but nevertheless are numerically distinct tokens of the shared type. It should be noted that this is not simply a reductive notion of tropes, as while the qualities of tropes are determined by universals they exemplify, tropes are not identical to combinations of universals. Nevertheless, this alternative conceptualization is threatened by the Indiscernibility Challenge in an analogous way as the conceptualization in terms of tropes composed of qualitative and individuative aspects. It is so because a question arises in virtue of what tokens of the same type are numerically distinct and whether their mode of individuation is somehow supported by the way in which visual properties are experienced. The possible solutions to this question seem to be no different from, and equally problematic as, those discussed in the previous sections. In particular, one may postulate that tokens of the same type differ primitively (see section 4.3) or that distinct tokens in fact differ qualitatively as their qualitative character involves a reference to an object or a place (see section 5).

A proponent of the trope interpretation may also postulate that while in situations leading to the Indiscernibility Challenge two or more objects possess the same visual property, this is not inconsistent with the claim that the attributes of these objects, such as their colors or shapes, are tropes. More precisely, it can be claimed that having a property *F* consists in instantiating any trope belonging to an *F-class* of strictly similar tropes. If this is the case, then when analyzing an experience presenting an object *a* as having the color-attribute *F* and an object *b* with a strictly similar color-attribute *G*, a proponent of the trope

interpretation may state that objects *a* and *b* indeed have the same color-property because while *F* and *G* are distinct tropes, they belong to the same class of strictly similar tropes.

However, such a move reintroduces the problem as it may still be asked whether there is something in the visual phenomenology that justifies postulating a numeric distinction between attributes *F* and *G*. Attempts to provide such a justification will run into problems analogous to those described in the previous sections. In particular, (a) if color-attributes *F* and *G* are primitively individuated, then there is nothing in the phenomenology of visual states that corresponds to their primitive difference; (b) if they are individuated by the sum of their qualitative and relational aspects, then they themselves can be reduced to combinations of simpler universals; and (c) if they have an extended quantitative aspect, including a relation to an object or a place, then *F* and *G* are not strictly similar and so their qualitative aspects cannot support the claim that objects *a* and *b* have the same color-property by instantiating distinct members of the same class of strictly similar tropes.

7. Visual Properties as Universals

In the previous section, I argued that the responses to the Indiscernibility Challenge available to a proponent of the trope interpretation of visual properties are implausible given certain phenomena regarding visual phenomenology, and that the only available option for trope theorist is to adopt a reductive notion of tropes. Here I will demonstrate that the analogous problems do not threaten an interpretation of visual properties in terms of universals. This is because all major aspects of the way in which vision presents properties can be easily accommodated by some version of the universal interpretation. For illustration, let's use Armstrong's classic theory of universals (Armstrong 1978a). According to this approach, universals are always instantiated by at least one individual, so there are no 'free-floating'

properties, and can be multiply instantiated. Analogously, individuals are never 'bare,' as they always instantiate some properties. Furthermore, by virtue of being instantiated by physical individuals, universals have a spatiotemporal localization and they compose, together with instantiating individuals, particular 'state of affairs.' It should be noted that I do not wish to argue that Armstrong's theory is a proper theory of universals.[5] I focus only on showing that a theory that shares the above features with Armstrong's theory is a good candidate for a theory of visual properties.

The major characteristics of universals postulated in Armstrong's conception are in accordance with the way in which we visually perceive properties. In particular, vision never presents properties as not having any instantiations or as being outside of time and space. Furthermore, such a theory of universals has no problem responding to the Indiscernibility Challenge. A property *F* of an object *a* is experienced as being strictly similar to a property *G* of an object *b* simply because the objects *a* and *b* possess the same, multiply instantiated property. In contrast to the case of trope interpretation, there is no need to introduce any numeric distinction between *F* and *G* that does not seem to be supported by the visual phenomenology.

In addition, a framework that interprets visual properties as universals has no problem with accommodating the three most common types of visual changes concerning instances of strictly similar properties:

(1) The number of objects that are experienced as having strictly similar properties may change. For example, at first two objects that have indistinguishable shades of red can be presented, then five, and finally none.

(2) The individuals that are experienced as having strictly similar properties may change. For example, at first an object *a* may be presented, then disappear, and after a

[5] For instance, see Lewis 1983; Pautz 1997; Sider 2005 for a discussion.

temporal gap a new object *b* may appear with a strictly similar color-property. The empirical studies concerning visual tracking and re-identification of objects suggest that when an object changes in a way that violates spatiotemporal continuity, for instance it disappears and then appears in a disjoint location or after a temporal gap, the visual system interprets the situation as involving several distinct objects (see Scholl 2007 for review). Thus, it is likely that objects *a* and *b* will be visually experienced as distinct individuals.

(3) Properties may be experienced as changing their localization even without changing the object that instantiates them. For example, a red blob may be perceived as expanding or shrinking.

First, the changing number of objects experienced as having strictly similar properties may be explained by the ability of universals to change the number of their instantiations. Second, a universal property may be instantiated by distinct individuals at different moments. In virtue of this, it can be experienced as instantiated by object *a* at the beginning of a presentation and by object *b* at the end. Third, visual properties may change their localization by being instantiated by objects whose localizations are changing.

7.1 Constancy Challenge

Nevertheless, it has been postulated that the perceptual phenomenon of property constancy poses a challenge for the universal interpretation of visual properties. Earlier, I referred to this phenomenon in order to demonstrate a problem concerning a version of the trope interpretation in which the qualitative aspect of visual properties is extended in order to include spatial relations. However, the same phenomenon is also believed to be problematic for the universal interpretation of visual properties. In particular, Almäng (2016) has argued

that the differences between experiences of property change and experiences of property constancy provide a reason for postulating a non-qualitative aspect of visual properties.

Experiences of property change consist in experiencing that one property is being replaced by another one with a distinct qualitative aspect. For instance, an object may change its color from red to green. In the case of property constancy, however, one experiences that the numerically same property changes its qualitative aspect. For instance, the color of an object may change its appearance depending on the distance from which it is observed or the lighting conditions, while still being perceptually recognized as the same color. It seems that to explain experiences of property constancy we have to assume the existence of non-qualitative aspects of properties that are responsible for their sameness despite qualitative changes.

Because of this, the phenomenon of property constancy may pose a problem for the universal interpretation of visual properties as this interpretation does not assume any individuating aspect that is distinct from the qualitative aspect. In consequence, it may seem that while the Indiscernible Challenge poses a problem for the trope interpretation of visual properties, there is also a Constancy Challenge that is equally problematic for the universal interpretation.

Nevertheless, I believe that there is a way in which the universal interpretation of visual properties can accommodate the phenomenon of constancy without postulating an additional, individuating aspect distinct from the qualitative aspect. A proponent of the universal interpretation may argue that a visual property *P* has a conjunctive structure such that each element of the conjunction specifies the qualitative aspect of *P* in a certain context, determined by certain relations to other properties presented at the same time and relations to the perceiving subject. According to such view, a visual property is a certain visual property *P* if and only if it satisfies a specific conjunction, for instance, *has qualitative aspect* Q_1 *when in*

context C_1 and, …, and qualitative aspect Q_n when in context C_n. For example, a white color property has a grayish qualitative aspect when spatially co-located with a shade-property and a brighter qualitative aspect when associated with properties concerning high lightness intensity.[6] Similarly, a visual property may appear different depending on the specific relation in which it stands to the observer. In particular, the qualitative character of a property is partially determined by distance from the perceiver, the amount of applied attentional resources (see Carrasco and Barbot 2019), the influence of higher-order cognitive mechanisms on the way the perceptual stimuli are processed (see Briscoe 2015), and even the length of observations (e.g., due to adaptation of receptors). For example, the qualitative aspect of some complex shape property *P* is likely to be different when *P* stands in such perceptual relation to a subject that it is perceived for a short time without attentional focus and in a case when a perceiver attends to *P*. In the first situation the specific relations between parts of the considered shape will be less phenomenally salient than in the second. Distinct visual properties are associated with distinct conjunctions, specifying their qualitative aspect in various contexts.

From this view, visual properties are experienced as persisting through qualitative changes if those changes obey certain patterns which can be discovered by investigations concerning rules of perceptual constancy (see Palmer 1999, pp. 125-136). Perceptual mechanisms of constancy perception are aimed toward detecting variations in how a property looks in varying contexts. Generally speaking, when confronted with a property with quality *Q1* in context *C1* and subsequently with a property with quality *Q2* when the context is changed to *C2*, the constancy mechanism tries to establish whether there is a property such

[6] In fact, a visual property may be simultaneously present in more than one context if, for instance, it stands in a perceptual relation to more than one subject or is multiply instantiated in such way that each instantiation stands in different relations to other properties.

that its conjunctive structure has *Q1* in *C1* and *Q2* in *C2*. If the verdict is positive, property constancy is experienced. Otherwise, one experiences a property change. For example, if a white color property becomes more grayish due to changing relations with lightness-related properties, it is experienced as numerically the same. However, other modifications of qualitative aspect, like a transition from white to red, are associated not with experiences of constancy but with experiences of property change. Similarly, certain modifications in how a shape looks that result from a changing relationship to an observer (for instance a perspective from which a shape is perceived) do not indicate that one shape was replaced by a numerically distinct one, while other changes are recognized as cases of changing from one shape into another. Of course, the constancy mechanisms are not always successful, for instance due to lack of data about the current context, or about all relevant relations between context and the qualitative aspect of a certain property. However, the existence of the constancy illusion does not falsify a general claim that a difference between constancy experiences and change experiences results from verdicts of mechanisms attempting to track systematic variations between context and perceptible qualities of properties.

The proposed solution shows that a difference between property change experiences and property constancy experiences can be accommodated without postulating an additional individuative aspect distinct from the qualitative aspect. However, adopting such a solution requires modification of the relation between strict similarity and identity, because properties are not simply identical when strictly similar in some particular context, but identical when strictly similar in *all* relational contexts. This is because it is theoretically possible that universal properties *F* and *G* may have the same qualitative aspect in context C_1 but distinct qualitative aspects in context C_2. Nevertheless, this modification does not undermine the possibility that the same visual property can be multiply instantiated in a single perceptual

experience, and while perceptual indiscernibility in a given context does not entail identity of properties, it is usually a reliable indicator of identity.

7.2 Instantiation and parthood

Apart from the argument concerning perceptual constancy, the philosophical literature offers two other arguments that attempt to reject the universal interpretation by relying on the way in which properties are visually experienced.

First (Mulligan et al. 1984, 300; Nanay 2012, 8), it is believed that it is counterintuitive to characterize visual properties as instantiations of universals because this involves the strange claim that we perceive three things: individuals, properties, and the instantiation-ties connecting them, instead of common objects that have certain properties. However, it is not clear why this argument is offered against proponents of universals since it is easy to see that those who interpret visual properties as tropes face an analogous difficulty, as they should claim that we do not simply perceive individual objects but objects instantiating particularized properties that cannot be multiply instantiated or whose strict similarity does not entail identity. Nevertheless, I believe that this is really not a problem. This is because those who interpret visual properties as universals (and analogously, those who interpret them as tropes) do not have to claim that vision presents universals as connected to individuals by an additional instantiation-element. What is needed, rather, is justification that the way in which properties are visually experienced is consistent with the characteristics attributed to them by universal or trope theories. While I believe that this can be easily given in the case of the universal interpretation, the trope interpretation faces a serious problem generated by the Indiscernibility Challenge.

Second (Mulligan 1999, 174), it has been postulated that the content of visual states should not be interpreted in terms of universals instantiated by individuals because perception represents the environment in terms of mereological relations and not in terms of instantiation between individuals and properties. However, according to psychological considerations, the mereological aspect of perception is only half the story. Of course, vision represents part–whole relations between simpler and more complex units, for example between four lines and the square they compose. Nevertheless, the basic units that enter mereological relations, like edges or regions filled-in with uniform colors, are not themselves constructed by applying part–whole relations (Palmer and Rock 1994). The usual way of speaking in psychological theories is to state that such units result from "bounding" represented properties, locations, or objects, which, for example, allows for combining a certain color with a spatial position and shape (Treisman 1998). This shows that to properly describe what is visually represented, we are not forced to speak solely about wholes constructed in virtue of mereological relations, but can also take into consideration instantiation-like relations combining properties with objects and locations.

8. Conclusions

Characterizing visual properties in terms of tropes is an important position within the contemporary philosophy of perception. However, as I have argued, the way in which properties are visually presented poses a problem for trope interpretations of visual properties. This is because they have difficulties fending off the Indiscernibility Challenge, i.e. the fact that ordinary, accurate visual experiences can present two objects as having strictly similar properties. While in principle a proponent of the trope interpretation has several options for responding to this challenge, these options are inconsistent with the way in which human

vision presents the sameness of visual properties. The only viable move for a proponent of the trope interpretation is to characterize tropes in a reductive way, as reducible to combinations of universals. On the other hand, the problem concerning the Indiscernibility Challenge does not arise for the universal interpretation of visual properties, as according to the universal interpretation sameness of the qualitative aspect is sufficient for the identity of visual properties.

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