Pictures and Properties

Abstract: It's a platitude that a picture is realistic to the degree to which it resembles what it represents (in relevant respects). But if properties are abundant and degrees of resemblance are proportions of properties in common, then the degree of resemblance between different particulars is constant (or undefined), which is inconsonant with the platitude. This paper argues this problem should be resolved by revising the analysis of degrees of resemblance in terms of proportion of properties in common, and not by accepting a sparse theory of properties or by denying that degree of realism is degree of resemblance (in relevant respects).

I

The following three theses are individually plausible, but jointly inconsonant:

(1) The degree of realism of a picture is the degree to which it resembles what it represents (in relevant respects)

(2) Properties correspond to (possible) predicates, so the number of properties is the number of (possible) predicates

(3) The degree of resemblance between particulars is their number of properties in common divided by their number of properties in total

This paper argues for resolving this problem by revising the third thesis.

The first thesis, that a picture's degree of realism is the degree to which it resembles what it represents (in relevant respects), is plausible because it's a natural extension of the analysis of depiction in terms of resemblance to the analysis of depictive realism, as well as a piece of common sense in its own right. It's natural to think the degree of realism of my portrait, for example, is the degree to which it resembles me in relevant respects. And it's natural to think that the Mona Lisa, for example, is more realistic than *Les Demoiselles d'Avignon*, because the Mona Lisa resembles Lisa to a greater degree than *Les Demoiselles d'Avignon* resembles the young women of Avignon.

Not every respect of resemblance between a picture and what it represents is relevant to its degree of realism. A painting of a sailing ship, for example, does not depict the sails more realistically because it resembles them in respect of being canvas. So the

degree of realism of a picture is not its degree of resemblance to what it represents simpliciter, but its degree of resemblance to what it represents in relevant respects (Sartwell, 1994, 7). A painting of a sailing ship, for example, does not depict the sails more realistically if it resembles them in respect of being canvas, but it does represent them more realistically if it resembles them in respect of colour.

The second thesis, that because properties correspond to (possible) predicates, the number of properties is the number of (possible) predicates, is plausible on the hypothesis that the meaning of a (possible) predicate is a property: the meaning of the predicate 'is white', for example, is the property of being white. The second thesis is also entailed by predicate nominalism, according to which a particular has a property if and only if it satisfies a (possible) predicate. And it is entailed by class nominalism, according to which an individual has a property if and only if it belongs to the class of individuals which have that property (Lewis, 1983, 350).

The third thesis, that the degree of resemblance between particulars is their number of properties in common divided by their number of properties, is plausible because it's a natural extension of the analysis of resemblance as having properties in common to the analysis of degree of resemblance. It's natural to suggest, for example, that peas in a pod resemble each other to a high degree because their properties in common – like greenness, roundness and yuckiness – are a high proportion of their properties in total. And it's natural to suggest that the more properties a picture has in common with what it represents, the more closely it resembles what it represents.

The three theses are in tension with each other because the second two theses entail that the degree of resemblance between different particulars is constant if defined (as I will explain below). So in combination with the unqualified version of the first thesis, according to which degree of realism is simply degree of resemblance, the second two theses entail that the degree of realism of any picture different from what it represents is constant if defined. But if this is the case, no two pictures different from what they represent differ in degree of realism. The Mona Lisa and *Les Demoiselles D'Avignon* are both, for example, realistic to the same degree. But this is absurd.

The qualified version of the first thesis, according to which the degree of realism of a picture is its degree of resemblance to what it represents in relevant respects, does not combine with the second two theses to entail that the degree of realism of a picture is constant if defined (Sartwell, 1994, 7). Even if colour photographs do not resemble what they represent more than black and white photographs do, for example, colour photographs resemble what they represent in all relevant respects in which black and white photographs do, but also resemble what they represent in the relevant respect of colour. So colour photographs are more realistic than black and white photographs.

But this solution to the problem merely shifts the bump in the rug. Although not every respect of resemblance between a picture and what it represents is relevant to its degree of realism, a respect of resemblance between a picture and what it represents is relevant to its degree of realism only if it contributes to a greater degree of resemblance between a picture and what it represents. Colour is relevant to the degree of realism of photographs, for example, because it contributes to a greater degree of resemblance between colour photographs and what they represent than between black and white photographs and what they represent.

But if it's accepted that, because the number of properties is the number of (possible) predicates and degrees of resemblance are proportions of properties in common, the degree of resemblance between different particulars is constant if defined, it follows that no respect contributes to a greater degree of resemblance between a picture and what it represents than any other. Colour, for example, would not contribute towards a greater degree of resemblance of colour photographs to what they represent, because although colour photographs resemble what they represent in respect of colour, their degree of resemblance to what they represent would still be constant if defined.

I will argue that the problem should be resolved not by exploiting the qualification in the thesis that degree of realism is degree of resemblance (in relevant respects), nor by denying that the number of properties is the number of (possible) predicates. Instead, the problem should be resolved by analysing degree of resemblance as a weighted proportion of properties in common. The degree of resemblance between particulars, according to this revision, is the sum of the weights of their properties in common,

divided by the sum of the weights of their properties in total. I'm unsure if the weights are subjective degrees of importance or objective degrees of naturalness.

The second section explains how predicate nominalism, together with the thesis that degree of resemblance is proportion of properties in common, entails that degree of resemblance between different particulars is constant if defined. The third section explains how the same conclusion follows from class nominalism. The fourth section considers resolving the problem by rejecting both class and predicate nominalism in favour of a sparse conception of properties. The fifth section argues for resolving the problem by revising the analysis of degree of resemblance. Finally, the sixth section concludes by discussing the objectivity of depictive realism.

Two clarifications. First, the word "realism" refers to different doctrines in politics and philosophy. Within philosophy it refers to different doctrines in metaphysics and aesthetics. And within aesthetics it refers to both stylistic and thematic realism, and to literary and depictive realism. Even within the philosophy of pictures, "realism" may refer to photographic realism, illusionism and a variety of other aesthetic virtues (see Lopes, 2006). I shall defend the thesis that degree of realism is degree of resemblance (in relevant respects) in at least one sense of the word "realism", but of course I won't deny that there are many other senses which deserve the name equally well.

Second, depictions of non-existents, non-particulars and depictive misrepresentations can be realistic in the intended sense, even if they don't resemble what they represent. A depiction of a dragon, for example, cannot resemble a dragon to a high degree, since dragons do not exist, but a depiction of a dragon can be highly realistic. A picture of a horse may be highly realistic, even if it does not resemble any particular horse to any particular degree. And a wanted poster may realistically depict a criminal even if, since the police are completely misinformed about the appearance of the criminal, its degree of resemblance to the criminal (in relevant respects) is zero.

But depictions of non-existents, non-particulars and depictive misrepresentation aren't merely problematic for the thesis that the degree of realism of a picture is its degree of resemblance to what it represents (in relevant respects), but are also problematic for the thesis that depiction is mediated by resemblance. Since different proponents of the

resemblance theory of depiction favour different solutions to this problem, I'll restrict discussion to the accurate depiction of particular existents. Whatever the solution to this problem is for the analysis of depiction in terms of resemblance, it should carry over to the problem for the analysis of realism in terms of degree of resemblance.

II

According to predicate nominalism, particulars have properties in virtue of satisfying predicates (Armstrong, 1978a, 13). The screen before me has the property of being white, for example, because it satisfies the predicate 'is white'. Goodman's position in *Languages of Art* is a version of predicate nominalism; he writes, for example, that "... application of a label [predicate] (pictorial, verbal, etc.) as often effects as it records a classification. The "natural" kinds are simply those we are in the habit of picking out for and by labelling" (1968, 32). Predicate nominalism, since it maintains the properties there are depends on the way we speak, is a kind of subjectivism.

A predicate is a sentence with a name removed. The predicate 'is white', for example, results from removing 'snow' from 'snow is white'. A (named) particular satisfies a predicate if and only if replacing the gap in the predicate by the name of the particular produces a true sentence. Snow satisfies 'is white', for example, because the sentence 'snow is white' is true. In the sense relevant to predicate nominalism, two predicates which are necessarily satisfied by all the same particulars are the same. The predicates 'is white', 'ist weiß' and 'is not unwhite', for example, although they sound different, are all counted as one (Armstrong, 1978a, 7).

It follows from predicate nominalism that a particular has a property if and only if it satisfies a corresponding predicate. The screen before me has the property of being white, for example, if and only if it satisfies the predicate 'is white'. And so it follows from predicate nominalism that the number of properties is the number of predicates: since the property of being white corresponds to the predicate 'is white', the property of being red corresponds to the predicate 'is red', … and so on, there is a property corresponding to every predicate and vice versa. It's just this biconditional, and not the purported priority of its left hand side, which leads to the problem raised below.

Some depictions resemble what they represent in ways that are not easily articulated. There is not a word, for example, for every shade of colour in respect of which the Mona Lisa resembles Lisa, so there may not be a predicate corresponding to every property in respect of which the Mona Lisa resembles Lisa. This is a general problem for predicate nominalism. As David Armstrong writes "It is clearly possible, and we believe it to be the case, that particulars have certain properties and relations which never fall under human notice" (Armstrong, 1978a, 21). If so, then it's very likely that there are some properties that do not correspond to any predicate.

The standard solution to this problem is to argue that particulars have properties in virtue of satisfying possible predicates (Armstrong, 1978a, 22). Although there may be no predicate corresponding to the exact shades of colour in respect of which parts of the Mona Lisa resemble Lisa, for example, there are possible predicates which do correspond to those shades which we could introduce, for example, by ostension. If this solution is adopted, then the subjectivism of predicate nominalism is mitigated, because whereas which predicates we in fact employ depends on us, which possible predicates we might employ is a matter of necessity and independent of us.

As well as simple predicates like 'is red' and 'is square' there are complex predicates like 'is red or square' and 'is red and square'. Particulars satisfy complex predicates in virtue of satisfying combinations of simple predicates. *Black Square*, for example, satisfies 'is red or square' but not 'is red and square' in virtue of satisfying 'is black' and 'is square', whereas *Red Square* satisfies both 'is red or square' and 'is red and square' in virtue of satisfying 'is red' and 'is square'. *Black Square* and *Red Square* both satisfy 'is red or not red' but not 'is red and not red' no matter what combination of simple predicates they satisfy.

The combinations of simple predicates are two to the power of the number of simple predicates, or less if some of the simple predicates entail each other, are contraries, or are subcontraries (Watanabe, 1969, 367). If the simple predicates are, for example, 'is red' and 'is square', there are four simple predicate combinations: both 'is red' and 'is square', 'is red' only, 'is square' only and neither 'is red' nor 'is square'. If the simple predicates are 'is red' and 'is coloured', then there are just three combinations, since

nothing satisfies 'is red' but not 'is coloured'. And likewise if the simple predicates are 'is red' and 'is black', since nothing satisfies both 'is red' and 'is black'.

If n is the number of simple predicate combinations, the total number of predicates is 2^n, since there is a predicate which applies in virtue of each combination of simple predicate combinations (Watanabe, 1969, 367). If 'is red', for example, is the only simple predicate, there are two simple predicate combinations and so four predicates in total: 'is red', 'is not red', 'is red or not red' and 'is red and not red'. If 'is red' and 'is square' are the only simple predicates, then there are four simple predicate combinations and sixteen predicates in total, whereas if 'is red' and 'is black' are the only simple predicates, there are three combinations and eight predicates in total.

Each particular satisfies 2^{n-1} of the 2^n predicates, since all the predicates which apply to it must apply in virtue of the simple predicate combination it satisfies, but may apply in virtue of any combination of the remaining $n - 1$ simple predicate combinations. If 'is red' and 'is square', for example, are the only simple predicates, then *Red Square* satisfies all the predicates which apply to it in virtue of it satisfying 'is red' and 'is square', or eight of the sixteen predicates: 'is red or not red', 'is red or square', 'is not red or square', 'is square', 'is red or not square', 'is red', 'is red if and only if square' and 'is red and square'.

Likewise, any pair of different particulars both satisfy 2^{n-2} predicates, since all the predicates which apply to both of them must apply in virtue of the two simple predicate combinations they satisfy, but may apply in virtue of any combination of the remaining $n - 2$ simple predicate combinations (Watanabe, 1969, 377). If 'is red' and 'is square', for example, are the only simple predicates, then *Red Square* and *Black Square* satisfy all of the predicates which apply in virtue of them satisfying either 'is red' and 'is square' or 'is black' and 'is square', or four of the sixteen predicates: 'is red or not red', 'is red or square', 'is not red or square' and 'is square'.

In total, any two different particulars satisfy $2^{n-1} + 2^{n-1} - 2^{n-2}$ predicates, or the sum of the number of predicates satisfied by each minus the number of predicates satisfied by both. If 'is red', for example, is the only simple predicate, then *Red Square* and *Black Square* satisfy two predicates each, one predicate in common and three predicates in

total: 'is red', 'is not red' and 'is red or not red'. If 'is red' and 'is square' are the only simple predicates, *Red Square* and *Black Square* both satisfy eight predicates each, four predicates in common, and so eight plus eight minus four or twelve predicates in total.

So if the degree of resemblance between two particulars is their number of properties in common divided by their number of properties in total, and if, since properties correspond to predicates, the number of properties is the number of predicates, then the degree of resemblance between two different particulars is 2^{n-2} divided by $2^{n-1} + 2^{n-1} - 2^{n-2}$ or, in other words, one third. If, for example, the only simple predicate is 'is red', then a third of the predicates satisfied by *Red Square* and *Black Square* in total are satisfied by both. If 'is red' and 'is square' are the only simple predicates, then the number is four twelfths or, in other words, still a third.

If properties correspond to possible predicates, instead of predicates simpliciter, and if the number of possible predicates is infinite, then each particular possesses an infinite number of properties, and each pair of different particulars possess an infinite number of properties in common. In this case, if degree of resemblance between particulars is their number of properties in common divided by their number of properties in total, degree of resemblance between particulars is undefined, since it involves the division of an infinite number by an infinite number. Not all different particulars would have the same degree of resemblance: they would all have none.

So if degree of resemblance is simply proportion of properties in common, predicate nominalism entails that degree of resemblance between different particulars is a third if defined. Though the resemblance between *Red Square* and *Black Square* seems to be greater than the resemblance between a raven and a writing desk, for example, this is an illusion: *Red Square* and *Black Square* and the raven and the writing desk all resemble each other to degree half. And if there's any difference between ducklings in a brood, then the ducklings resemble a cygnet to the same degree they resemble each other, no matter how little the cygnet seems like the ducklings.

III

The same conclusions issuing from predicate nominalism can equally be drawn from class nominalism. According to the simplest version of class nominalism, properties are classes of individuals: an individual has a property if and only if it is a member of the class of individuals which have that property (Armstrong, 1978a, 15). The screen before me has the property of being white, for example, because it is a member of the class of white things. Which properties there are, according to class nominalism, does not depend on which predicates we employ, but only on which classes exist, so class nominalism is an objectivist analysis (Armstrong, 1978a, 29).

Nevertheless, although the existence of classes is objective, class nominalism does not escape the counterintuitive consequences of predicate nominalism. Any combination of individuals, no matter how arbitrary or heterogeneous, is a class. Just as there is a class of white things and a class of red things, for example, there's a class of things mentioned in the dictionary and a class containing just a raven and a writing desk. In general, the number of classes of some things is two to the power of the number of the things. If there are just two things, for example, there are four classes of those things: the class of the first, the class of the second, the class of both and the class of neither.

If n is the number of individuals, then each individual is in 2^{n-1} classes of individuals, since each individual is in a class corresponding to each combination of the remaining n − 1 individuals. Likewise, any two individuals both belong to 2^{n-2} classes of individuals, since any two individuals both belong to a class corresponding to each combination of the remaining n − 2 individuals (Goodman, 1970, 443) and any two individuals belong to $2^{n-1} + 2^{n-1} - 2^{n-2}$ classes of individuals in total. So any pair of individuals are both in 2^{n-2} of the $2^{n-1} + 2^{n-1} - 2^{n-2}$ or in other words one third of the classes of individuals either individual is in.

So if degree of resemblance is proportion of properties in common, class nominalism entails that any two individuals resemble each other to degree one third. If *Red Square* and *Black Square*, for example, were the only individuals, there would be four classes: the class of squares, the class of red things, the class of black things, and the empty class. *Red Square* would be a member of the class of squares and the class of red things whereas *Black Square* would be a member of the class of squares and the

class of black things. So of the three properties they would have in total – being red, being black and being square – each would have one – being square.

The same conclusion also issues from more complex versions of class nominalism. Suppose, for example, properties are classes of possible individuals (Lewis, 1986, 50) and let n be the number of possible individuals. Then each individual is in 2^{n-1} classes of possible individuals, since each is in a class corresponding to each combination of the remaining $n – 1$ possible individuals. Likewise, any two individuals both belong to 2^{n-2} classes of possible individuals, since they both belong to a class corresponding to each combination of the remaining $n – 2$. So any two individuals are in 2^{n-2} of the 2^{n-1} + $2^{n-1} – 2^{n-2}$, or one third, of the classes of possible individuals either is in.

If properties are functions from possible worlds to classes, which take each possible world to the set of individuals possessing the property at that world (Lewis, 1986, 53), and n is the sum of the number of individuals in each possible world, then the number of properties is 2^n, since there are two possibilities for each individual in each possible world: the function may take the possible world to a class containing the individual, or it may not. All individuals still have 2^{n-1} properties and all pairs of individuals still have 2^{n-2} properties in common, so the proportion of properties two individuals have in common is still 2^{n-2} divided by 2^{n-1} + $2^{n-1} – 2^{n-2}$ or, in other words, still one third.

If properties are functions from centred possible worlds to sets, then the objectivity of class nominalism is mitigated, since particulars will instantiate properties only relative to the indices of the centred possible world, one of which might be a person (Egan, 2006). But if centred worlds are ordered quadruples of locations, orientations, times and worlds, rather than ordered triples of persons, times and worlds, then the relativity involved in defining properties as functions from centred possible worlds is not relativity to people, and the objectivism of the analysis is unmitigated. In either case, this complication has no effect on the numbers or proportions of properties.

If the number of (possible) individuals or the sum of the number of individuals in each possible world is infinite, then the number of properties is also infinite. For any individual, the number of properties it has is infinite, and for any two individuals, the number of properties they have in common is also the same infinity, so the proportion

of properties they have in common is undefined. In this case, if degree of resemblance is proportion of properties in common, then the degree of resemblance between any two individuals is undefined, and it's still the case that no pair of individuals resemble each other to a greater degree than any other (Goodman, 1970, 444).

Because this conclusion is so counterintuitive, the natural solution to the problem is to deny predicate and class nominalism. As John Hyman writes "Goodman's claim that "the criteria of resemblance vary with changes in representational practice" ... is a sign of his allegiance to a form of nominalism. ... If we examine judgements about resemblance in the light of this doctrine the results are striking. ... That is how the doctrine ... challenges the traditional view of realism as an objective quality we can perceive in art ... But the doctrine is demonstrably false" (Hyman, 2006, 185-7). I will argue in the next section that denying nominalism only exacerbates the problem.

IV

Sparse theories of properties deny there is a property corresponding to every possible predicate, and so deny the number of properties is the number of possible predicates. Which predicates correspond to properties, according to sparse theories, is revealed *a posteriori* by total science (Armstrong, 1978b, 7-9). Whether the predicate 'is white' corresponds to a property of being white, for example, is an *a posteriori* question; the existence of the property of being white cannot be deduced from the existence of the predicate 'is white'. Because whether a property exists or not, according to sparse theories, is independent of us, sparse theories are typically objectivist.

As well as simple properties like being red, being black and being square, there are complex properties like the property of being red and square and the property of being black and square. A conjunction of properties, for example, is a property, according to some sparse theories of properties, if and only if a particular instantiates its conjuncts (Armstrong, 1978b, 30). So if being red and being square are properties, for example, then their conjunction being red and square is a property as well. But even if being red and being black are properties, their conjunction being red and black is not a property, since no particulars are both red and black.

Particulars instantiate complex properties in virtue of instantiating combinations of simple properties. *Black Square*, for example, instantiates the property of being black and square in virtue of instantiating the property of being black and instantiating the property of being square. But whereas there is a complex predicate corresponding to every combination of simple predicate combinations, it's important that there's not, according to sparse theories, a property corresponding to every combination of simple property combinations, because if there were and degree of resemblance is proportion of properties in common, degree of resemblance would still be one third if defined.

In particular, it's important that there are not, according to sparse theories, disjunctive properties: if being red and being black are properties, for example, being red or black is not a property, since the redness of *Red Square* and the blackness of *Black Square* is not a respect of similarity between them. As David Armstrong writes, "Suppose *a* has a property P but lacks Q, while *b* has Q but lacks P. It seems laughable to conclude from these premises that *a* and *b* are identical in some respect. Yet both have the "property", *P or Q*" (Armstrong, 1978b, 20). Ravens don't resemble writing desks in virtue of being ravens or writing desks.

Proponents of sparse theories of properties equally stress the inexistence of negative properties: if being red, for example, is a property, being not red is not a property. As Armstrong writes, "If particulars are identical in a respect, then they resemble each other. But it is surely implausible to suggest that *not being P* is a point in which *a*, *b*, *c* … etc. resemble each other" (Armstrong, 1978b, 23). Peas in a pod resemble each other in respect of greenness because they have the common property of being green, but ravens and writing desks do not resemble each other in respect of being not green, according to the sparse theory, because there is no property of being not green.

So even if the degree of resemblance between particulars is their number of properties in common divided by their total number of properties, sparse theories of properties do not entail that degrees of resemblance are constant if defined, since they deny there is a property corresponding to every possible predicate, and so deny that the number of properties is the number of possible predicates. If the only simple property is being red, for example, the degree of resemblance between *Red Square* and *Black Square* is,

according to the sparse theory, zero, because since the property of being red or not red doesn't exist, *Red Square* and *Black Square* have no property in common.

If the simple properties are being red and being square, then there are three properties in total according to the sparse theory: being red, being square, and being both red and square. *Red Square* and *Black Square* have a third of their properties – being square – in common. But if being black is also a property, then *Red Square* and *Black Square* have one property – being square – out of five – being red, being black, being square, being red and square, and being black and square – in common. So proponents of the sparse theory can accept that degrees of resemblance are proportions of properties in common, without concluding that degree of resemblance is one third if defined.

Even if the number of properties is infinite, sparse theories of properties do not entail that degrees of resemblance between particulars are undefined. If every exact shade of colour is a property, for example, then there are infinitely many properties, since there are infinitely many exact shades of colour. But since each particular instantiates only a single shade, each particular may still instantiate only finitely many properties, and so the number of properties two particulars have in common divided by their number of properties in total need not be undefined. So long as two particulars instantiate only finitely many of the infinite properties, their degree of resemblance will be defined.

So since it denies that there are negative and disjunctive properties, the sparse theory of properties does not entail that the number of properties is the number of (possible) predicates and might be expected to be consonant with the thesis that the degree of resemblance between particulars is their number of properties in common divided by their number of properties and the thesis that a picture is realistic to the degree that it resembles what it represents (in relevant respects). But the sparse theory of properties still faces two problems. The first can be avoided, but the second requires revising the analysis of degree of resemblance as proportion of properties in common.

Firstly, the sparse theory of properties is inconsonant with the theses because it is too sparse. According to many proponents of the sparse theory, the sparse properties are only those of fundamental physics. As David Lewis, for example, writes "Physics has its short list of 'fundamental physical properties': the charges and masses of particles,

also their so-called 'spins' and 'colours' and 'flavours', … an inventory of the *sparse* properties of this-worldly things" (Lewis, 1986, 60). But if only fundamental physical properties exist, most pictures have no properties in common with what they represent – the Mona Lisa, for example, does not resemble Lisa in respect of mass.

The problem isn't with the thesis that the degree of realism of a picture is its degree of resemblance to what it represents (in relevant respects), but an inconsonance between the analysis of degree of resemblance as proportion of properties in common and the conception of sparse properties as the properties of fundamental physics. Fundamental physical properties are not the respects in which ordinary objects resemble each other, so the conception of sparse properties as fundamental physical properties is ill suited to feature in the analysis of resemblance (Schaffer, 2004, 94). Resemblances between friends, for example, aren't resemblances in respect of mass either.

However, there are other conceptions of sparse properties which are suited to feature in the analysis of resemblance. If the sparse properties aren't only those which feature in fundamental physics, but those which feature in total science, including chemistry, biology, psychology, and sociology, ordinary objects might be expected to resemble each other in respect of those properties (Schaffer, 2004, 94). Resemblances between friends, for example, are in respects which might feature in psychology or sociology, whereas resemblances between the Mona Lisa and Lisa are in respects which might feature in geometry or colour science.

But secondly, the sparse theory is inconsonant with the thesis that degree of realism is degree of resemblance (in relevant respects) and the thesis that degree of resemblance is proportion of properties in common because it denies the existence of negative and disjunctive properties, even when the respects of resemblance between some pictures and what they represent and other ordinary objects are often negative or disjunctive. Because it's its denial that negative and disjunctive properties exist which allows it to avoid the conclusion that degrees of resemblance are constant if defined, the sparse theory of properties cannot avoid this problem so easily.

Although *Black Square*, for example, is not a realistic depiction of anything, it might have realistically depicted a black night. But Armstrong writes that "... black surfaces

turn out to be, as a matter of scientific fact, surfaces which do not emit any light. So the predicate 'black', apparently a positive predicate, applies in virtue of a certain lack or absence in the particulars to which it applies" (Armstrong, 1978b, 52). If blackness is not a property, then *Black Square* does not have any property in common with a black night, and so *Black Square* resembles a black night to degree zero. But even if blackness is not a property, *Black Square* could still realistically depict a black night.

(There are other conceptions of colour according to which blackness is a property, but the problem still arises for any conception of properties according to which negative properties do not exist, because it is possible to depict something as lacking a property by drawing a picture which lacks that property. A more intuitive conception of colour, for example, may allow that particulars may lack colour through being transparent, or in some other way. If so, then it should be possible to depict something as uncoloured by using a picture which is uncoloured. But if being uncoloured is not a property, this involves no resemblance between the picture and what it represents.)

The same problem arises with the rejection of disjunctive properties. *Red Square*, for example, may have being a realistic painting of a peasant women in a red dress, which resembles her in respect of redness. But redness is the disjunction of all the different shades; being red is being scarlet, or being crimson or ... etc. So if the shades of red are properties and disjunctions of properties are not properties, then being red is not a property, and so unless *Red Square* is the same shade of red as the peasant woman's dress, *Red Square* resembles the woman to degree zero (in relevant respects). But the degree of realism of *Red Square* in this case, while low, need not be zero.

(It might be objected that a determinable isn't merely a disjunction of determinates. Being yellow or angry, for example, is not a determinable of which being yellow and being angry are the determinates. But although not all disjunctions are determinables, all determinables are disjunctions of their determinates, since the determinable entails the disjunction, and the disjunction entails the determinable, so the determinable and the disjunction are equivalent. Since being red entails being one of the shades of red, for example, and being one of the shades of red entails being red, being red and being one of the shades of red are equivalent, and being red is their disjunction.)

The problem isn't with the thesis that the degree of realism of a picture is its degree of resemblance to what it represents (in relevant respects), but with the combination of the sparse theory of properties and the thesis that the degree of resemblance between particulars is their proportion of properties in common. Just as *Black Square* might realistically depict a dark night, even if being black is not a property, *Black Square* resembles a dark night, even if being black is not a property. Likewise, just as *Red Square* may realistically depict a peasant women wearing another shade of red, *Red Square* resembles a peasant women wearing another shade of red.

So the sparse theory of properties is inconsonant not just with the thesis that degree of realism is degree of resemblance (in relevant respects), but also with the analysis of resemblance as having properties in common. Instead, a particular resembles another, according to the sparse theory of properties, if and only if a property of the former resembles a property of the latter (Armstrong, 1978b, 96). Oranges resemble lemons, for example, because oranges are a shade of orange which resembles the yellow shade of a lemon. And though the shade of red of *Red Square*, for example, is not the shade of red the peasant women wears, they resemble each other because their shades do.

Degree of resemblance, according to the sparse theory of properties, is not proportion of properties in common. Rather, the degree of resemblance of something to another is the proportion of the first thing's properties which resemble the second thing's properties, weighted according to those properties' degrees of resemblance. Peas in a pod, for example, resemble each other to a high degree because a high proportion of the peas' properties resemble each other to a high degree. But *Red Square* resembles a peasant women to a low degree, because only a few of their properties, such as their shades, resemble each other to a high degree.

This revision avoids the problem posed by the rejection of disjunctive properties, but not the problem posed by the rejection of negative properties. Since being black, for example, is not a property, *Black Square* not only fails to have a property in common with a black night, but also fails to have any property which resembles any property of a black night. In general, whereas particulars with different properties can resemble each other, according to the sparse theory of properties, in virtue of their different

properties resembling each other, particulars which lack properties cannot resemble each other in virtue of the properties they lack resembling each other.

V

Even if it is not combined with the thesis that the degree of realism of a picture is its degree of resemblance to what it represents (in relevant respects), the thesis that the degree of resemblance between different particulars is constant if defined is absurd: it's simply not the case that all different particulars resemble each other to the same degree. So the problem should be resolved by denying that since there is a property corresponding to every (possible) predicate, the number of properties is the number of (possible) predicates, or by denying that degrees of resemblance are proportions of properties in common.

But since denying that because there is a property corresponding to every (possible) predicate the number of properties is the number of (possible) predicates leads to a revision of the analysis of degree of resemblance as proportion of common properties in any case, the most conservative solution is to just revise the analysis of degree of resemblance. Different properties, according to this revision, have different weights in determining degrees of resemblance: the degree of resemblance between particulars is the sum of the weights of the properties they have in common divided by the sum of the weights of the properties they have in total (Watanabe, 1969, 382).

If being red, for example, is the only simple property, then the degree of resemblance between *Red Square* and *Black Square* is the weight of being red or not red divided by the sum of the weights of being red, of being not red, and of being red or not red. If the weight of being red or not red is less than half the sum of the weights of being red and of being not red, then the degree of resemblance between *Red Square* and *Black Square* is less than one third, whereas if the weight of being red or not red is greater than half the sum of the weights of being red and of being not red, then the degree of resemblance between *Red Square* and *Black Square* is more than one third.

Whether it is combined with a subjectivist theory of properties, such as an unqualified version of predicate nominalism, or an objectivist theory of properties, such as an

unqualified version of class nominalism, analysing degrees of resemblance in terms of weighted proportions of properties in common potentially introduces a new source of subjectivity into the analysis of resemblance. As Goodman writes "… *a* and *b* are more alike than *c* and *d* if the cumulative importance of the properties shared by *a* and *b* is greater than that of the properties shared by *c* and *d*. But importance is a highly volatile matter, varying with every shift of context and interest ..." (1970, 444).

But even if degree of resemblance is a weighted proportion of properties in common, the weights need not be subjective degrees of importance, but may also be objective degrees of naturalness. As Lewis writes, "… an *adequate* theory of properties is one that recognises an objective difference between natural and unnatural properties; preferably, a difference that admits of degree … Natural properties would be the ones whose sharing makes for resemblance" (1983, 347). So while introducing weights into the analysis of degree of resemblance can introduce a new source of subjectivity, it needn't do so; whether it does or not depends on underlying metaphysical issues.

Because it doesn't deny that there are negative properties, this revision accommodates the fact that there is a degree of resemblance between *Black Square* and a black night, because even if being black is being not coloured, it does not follow that being black has no weight. But since properties differ in their weights, the revision accommodates the fact that there is a low or no degree of resemblance between ravens and writing desks in respect of being not green, because although it doesn't deny that the property of being not green exists, the property of being not green may have low or no weight. So there is no problem corresponding to that of the rejection of negative properties.

Likewise, because it doesn't deny that there are disjunctive properties, this revision accommodates the fact that there is a degree of resemblance between *Red Square* and a peasant woman wearing a different shade of red. But because disjunctive properties may differ in their weights, the revision accommodates the fact that the more closely the shade of *Red Square* resembles the shade of the peasant woman's clothes, the more closely *Red Square* resembles the peasant woman, because disjunctions of like shades of colour are weightier than disjunctions of unlike shades of colour. So there is no problem corresponding to that of the rejection of disjunctive properties.

If there is a property corresponding to every (possible) predicate, then each particular possesses either the property corresponding to that (possible) predicate or its negation. So if the number of (possible) predicates is infinite, then each particular possesses an infinite number of properties and, since if there is a property corresponding to every (possible) predicate different particulars have one third of their properties in common, all particulars have an infinite number of properties in common. If the weights have a positive minimum, then the sums of the weights of properties in common and in total are infinite as well, and degrees of resemblance are undefined.

So if the number of properties is the number of (possible) predicates, the number of (possible) predicates is infinite and degree of resemblance is a weighted proportion of common properties, then weight of properties has no positive minimum unless degree of resemblance is undefined. If there is an infinite number of properties which weigh more than a positive minimum, then degrees of resemblance are defined only between particulars possessing only a finite number of those properties. If there is an infinite number of determinate shades of colour with positive equal weight, for example, then each particular can possess only a single shade of colour.

So by accepting that the number of properties is the number of (possible) predicates and analysing degrees of resemblance as weighted proportions of common properties, the conclusion that degree of resemblance between particulars is constant if defined is avoided in a way which is consonant with the platitude that the degree of realism of a picture is its degree of resemblance to what it represents (in relevant respects). The Mona Lisa has a high degree of realism, for example, because the sum of the weights of the (relevant) properties in common of the Mona Lisa and Lisa is high compared to the sum of the weights of the (relevant) properties in total of the Mona Lisa and Lisa.

<div align="center">VI</div>

The theses that degree of realism is degree of resemblance (in relevant respects), that the number of properties corresponds to the number of (possible) predicates, and that degree of resemblance is proportion of common properties are individually plausible, but jointly inconsonant, since the second two theses entail that degree of resemblance between different particulars is constant if defined, which entails, in combination with

an unqualified version of the first thesis, that the degree of realism of pictures which differ from what they represent is constant if defined. These conclusions are absurd, so one of the theses must be revised or rejected.

I have argued for resolving the inconsonance by revising the analysis of degrees of resemblance in terms of proportions of properties in common, and not by denying that there is a property corresponding to every predicate nor by denying or exploiting the qualification in the thesis that degree of realism is degree of resemblance (in relevant respects). Instead, degree of resemblance should be analysed as a weighted proportion of properties in common: the degree of resemblance between two particulars is the sum of the weights of their properties in common divided by the sum of the weights of their properties in total.

However the problem is resolved, it should not be resolved by denying the thesis that degree of realism is degree of resemblance (in relevant respects), because the thesis that degree of resemblance is constant if defined is implausible even in isolation. Any adequate theory of properties and resemblance, whether it is sparse or abundant, must accommodate the Moorean facts about which things resemble each other – facts more certain than any philosophical theory. And amongst these facts is the fact that pictures resemble what they represent, and that realistic pictures resemble what they represent to a high degree. So any adequate theory will have to accommodate these facts too.

But whereas all theories must accommodate the platitude that the degree of realism of a picture is its degree of resemblance to what it represents (in relevant respects), they may differ on the question of whether the degree of realism of a picture is subjective or objective. Goodman, for example, argues the platitude undermines the objectivity of depictive realism because "... insofar as resemblance is a constant and objective relation, resemblance between a picture and what it represents does not coincide with realism: and … insofar as resemblance does coincide with realism, the criteria of resemblance vary with changes in representational practice" (Goodman, 1968, 39).

But the thesis that degree of realism is degree of resemblance (in relevant respects) is consistent with the thesis that degree of realism is objective as well as the thesis that degree of realism is subjective. If combined with an objective analysis of properties,

such as an unqualified version of class nominalism, and an analysis of degree of resemblance as proportions of properties in common weighted by degrees of objective naturalness, then it entails degree of realism is objective. The objectivity of degree of realism depends on the objectivity of resemblance, which depends on the objectivity of properties and their weights: as long as the latter are objective, so are the former.

But if combined with a subjective analysis of properties, such as unqualified versions of predicate nominalism, or an analysis of degrees of resemblance as proportions of properties in common, weighted by degrees of subjective importance, then the thesis that degree of realism is degree of resemblance (in relevant respects) entails degree of realism is subjective. The subjectivity of degree of realism depends on the subjectivity of resemblance, which depends on the subjectivity of properties and their weights: as long as the latter are subjective, so are the former. So the analysis of degree of realism in terms of resemblance is consonant with its subjectivity or its objectivity.

But although the thesis that degree of realism is degree of resemblance (in relevant respects) is equally consistent with the thesis that degree of realism is subjective and with the thesis that degree of realism is objective, it should be emphasised that which thesis is correct is determined by its metaphysical underpinnings. The presupposition of predicate nominalism in Goodman's argument against the objectivity of depictive realism is not illegitimate, because the objectivity of depictive realism is dependent on the objectivity of resemblance. To avoid Goodman's conclusions one must not merely renounce predicate nominalism; one must embrace metaphysical realism.

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