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Perhaps, historically, the 'towards' aspect was not taken to be another relation because it was conceived to be analogous to the act of pointing which achieves reference to another without any physical/causal connection. Of course, reference itself is an unreduced semantic relation, albeit of a more implicit and abstract kind. It is erroneous to think that polyadic relations are eliminated completely in terms of monadic properties. (Mertz, 1993, p.197)

Obviously, Mertz is not an advocate of the property-reduction doctrine himself. In fact, he considers it to be one of the major mistakes in the history of philosophy.

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conceptual framework of analytic metaphysics to explain Avicenna's view and to show its place in this framework.

As we saw, Avicenna is a nominalist. He denies the existence of any kind of universal in the external world. As explained in the forgoing section, he admits the existence of kinds and properties in the outside world, but he denies their universality. As for relations, he reduces them to second order properties (tropes of towardsness) supervening on first order ones. In short, Avicenna holds that the world merely consists of particular kinds and properties. So, his view can be regarded as a kind of trope nominalism.

### Endnotes

1. This paper is originally an outline of my M.A. thesis.
2. The linguistic phenomena of abstract reference and subject-predicate discourse are similar phenomena (see Loux, 2001, p.20).
3. Although this and the next views have been labeled as "Platonic" and "Aristotelian", it is far from clear that Plato and Aristotle held them. After all, the concepts of "abstract" and "concrete" are modern concepts which were introduced into analytic philosophy only after Frege.
4. For further details about abstract entities see Gideon, R., "Abstract Objects", in *Stanford Encyclopedia of Philosophy (Fall 2005 Edition)*  
URL=<http://plato.stanford.edu/archives/fall2002/entries/abstractobjects>; and Balaguer, M., "Platonism in Metaphysics", in *Stanford Encyclopedia of Philosophy (Fall 2005 Edition)*  
URL=<http://plato.stanford.edu/archives/fall2002/entries/Platonism>.
5. For a detailed discussion of these two versions see Brownsstein, 1973.
6. For a good up-to-dated account of different variations of trope theory see J. Bacon, "Tropes", in *Stanford Encyclopedia of Philosophy (Fall 2005 Edition)*  
URL=<http://plato.stanford.edu/archives/fall2002/entries/tropes>.
7. For different senses of "essence" and "essential" see Yablo in *Routledge Encyclopedia of Philosophy*.
8. Just to be on the safe side, I say the doctrine may originate from Plato since no one knows whether he thought it out himself or got it from someone else. For all we know it may originate from ancient Egypt.
9. 'το ποοζ τι' is Aristotle's name of the category of relation.
10. What is valid for binary relations presumably is so also for polyadic relations in general.
11. Evidently, in a reduction carried through completely the *esse ads* must also be reduced. Otherwise, unreduced relational elements will be left over, not accounted for. Mertz dares a speculation regarding this matter:

Each of two related things has in itself an idea with respect to the other, which is not the idea the other has in itself with respect to the first. This is evident in things whose related terms differ, as in the case of the father. Its relation to fatherhood, which is a description of its existence, is in the father alone. [...] The same applies to the state of the son with respect to the father. There is nothing here at all which is in both of them. (Marmura, 1975, pp. 87-8)

The attributes (in the quotation called 'ideas') referred to in the first sentence are the two *esse ads* of the relevant *esse ins* of the two persons. In this particular case, the *esse ins* are the attributes of being-a-father (Fatherhood) and being-a-son (Sonship). Mertz proposes a formalization in which the property-reduction can be written in schematic form. The following is a preliminary version of the reduction. The term 'relation-property' is an alternative for the Latin '*esse in*'.

For any formal binary<sup>10</sup> relation predicate 'R' and relata x and y, there exist relation-properties R<sup>˘</sup> and R<sup>˘</sup> such that 'R(x,y)' is true  $\equiv$  [R<sup>˘</sup>(x) • :Towards-y(R<sup>˘</sup>) • :R<sup>˘</sup>(y) • :Towards-x(R<sup>˘</sup>)]. (1993, p.197)

Applied to the particular case of the father and his son the result is:

'a is the father of b' is true  $\equiv$  [:Fatherhood(a) • :Towards-b(Fatherhood) • :Sonship(b) • :Towards-a(Sonship)]. (Ibid)

Notice that the intended sense of 'relation-property' is not the same as the sense usually intended for the term 'relational property'. A relational property is supposedly a complex having at least one relation as constituent. (Possible examples of relational properties are being-a-son-of-Avicenna and being-a-son-of-a-Muslim-philosopher.) This is not true of relation-properties. Instead, the relational elements are smuggled in via towards-attributes. An upholder of the traditional view would not use the phrase 'smuggled in' though. For her, Towards-attributes are second-order attributes of the relation-properties. In other words, she conceives an *esse ad* as a second-order attribute of an *esse in*.<sup>11</sup>

### Conclusion

I tried to make a comparison between the views of contemporary analytic metaphysicians and those of Avicenna. First, I presented the contemporary analytic metaphysicians' views. Then, I used the

possessed only by one white thing.

But what has led him to reject the universality of accidents? Mertz has offered an interpretation of Avicenna according to which he uses the same "argument from contrary properties" to prove the particularity of accidents, too (Mertz, 1993). But I think that a more important reason that has led Avicenna to reject the universality of accidents is his special view about the relation between an accident and its substratum. As is clear from his description of an accident as "something whose being in itself is its being for something else" (Avicenna, 2000, p.73.), he holds that there is an essential relation of belongingness between an accident and its substratum: it is essential for an accident to belong to the thing to which it actually belongs. (Here "essence" and "essential" are used in their modal sense of the word<sup>7</sup>). It naturally follows that no one single accident can exist in more than one substance.

To make an analogy, the relation that Avicenna believes holds between an accident and its substratum is like the relation that Kripke believes holds between a person and her parents. According to Kripke, it is essential for a person to have been born of the parents of whom she has actually been born; in other words, she would not be the same person if she were born of different parents (Kripke, 1980, p.113). The same relation, Avicenna believes, holds between an accident and its substratum: it is essential for an accident to belong to the substance to which it actually belongs; it would be a different accident if it belonged to a different substance (Avicenna, 1960, pp.136-7).

Let us now turn to Avicenna's view about relations. According to Avicenna, relations can be reduced to properties. This idea perhaps originates from Plato (Cf. Cavarnos, 1975, pp.17-25)<sup>8</sup>. It is taken over by Aristotle. According to its classical shaping, it postulates that polyadic relations are reducible to monadic attributes combined with a peculiar characteristic of pointing (Cf., for example, the *Categories* 6a3727ff). In Greek, this pointing is called "το πρὸς τι"<sup>9</sup>. The scholastic Latin equivalent is 'esse ad', which can be translated as 'being towards'. Furthermore, the term used by the scholastics for the relevant monadic attributes is 'esse in', being equal to 'being in' in English. An *esse ad* is thought of as being a second-order attribute of an *esse in*. Avicenna follows Aristotle on this issue. Like Aristotle, he holds that binary relations can be reduced to the monadic attributes of their relata combined with towards-attributes of these monadic attributes. He illustrates his idea with the relation of being-a-father-of as an example:

11)	$W_{humanity1}$	9, 5, U.I. and M.P.
12)	$\neg W_{humanity2}$	10, 8, U.I. and M.P.
13)	$W_{humanity1} \bullet \neg W_{humanity2}$	11, 12, Conj.
14)	$\forall x, y, P(P_x \bullet \neg P_y) \rightarrow (x \neq y)$	It is impossible for some single entity to have contrary properties.
15)	$(W_{humanity1} \bullet \neg W_{humanity2}) \rightarrow (humanity_1 \neq huma$	14, U.I.
16)	$(humanity_1 \neq humanity_2)$	13, 15, M.P.

Let us now turn to Avicenna's view about properties. Avicenna refers to properties as "accidents" (*a'radb*). Redness, wisdom, and being 1.75 meters tall are examples of accidents. The question is whether there are such entities as accidents; and if so, whether they are particular or universal. In other words, the question is whether objects or substances have accidents; and if so, whether the accidents which are found in a given substance are numerically identical with the accidents of the same kind found in other substances.

Avicenna takes for granted that substances have accidents; but argues that they are every bit as particular as substances themselves. He explicitly states that "You must never think that an accident, one in number, exists in two substrata" (Marmura, 1975, p.88). According to Avicenna there is such an entity as whiteness in the world, but the whiteness<sub>1</sub> which is found in this apple is numerically different from the whiteness<sub>2</sub> which is found in that apple. According to him, there is not a single universal whiteness which is shared by all white things; but rather, there are as many particular whitenesses as white things, each of which

on the contrary, is black, 1.75 meters tall, wise, and so on.

Now, if the humanity which exists in John is numerically identical with the humanity which exists in Mary, then numerically one and the same thing (namely, humanity) will have contrary properties. The subsequent is evidently impossible. So is the antecedent. Therefore, there is not a universal humanity which is shared by all human individuals; rather, there are as many particular humanities as human individuals, each of those humanities being identical with one of human individuals. A full formalization of the argument is shown below.

1)	$\forall x, y(x = y) \leftrightarrow \forall P(P_x \leftrightarrow P_y)$	Leibniz's Law
2)	$(John = humanity_1) \leftrightarrow \forall P(P_{John} \leftrightarrow P_{humanity1})$	1, U.I.
3)	$(Mary = humanity_2) \leftrightarrow \forall P(P_{Mary} \leftrightarrow P_{humanity2})$	1, U.I.
4)	$John = humanity_1$	Ontological assumption
5)	$\forall P(P_{John} \leftrightarrow P_{humanity1})$	2, 4, M.P.
6)	$Mary = humanity_2$	Ontological assumption
7)	$\forall P(P_{Mary} \leftrightarrow P_{humanity2})$	3, 6, M.P.
8)	$\forall P(\neg P_{Mary} \leftrightarrow \neg P_{humanity2})$	7, Trans.
9)	$W_{John}$	It is an empirical fact that John is white.
10)	$\neg W_{Mary}$	It is an empirical fact that Mary is black.

So it is clear and evident that the humanity which is covered [that is, qualified] by ... accidents of an individual, is not covered by accidents of another individual, so that that humanity may be identically in both Zayd and Amr, and so that that humanity may be covered by contrary accidents. (Avicenna, 2000, p.538/ Cf. 1954, p.56)

The argument applied in the quoted passages can be called the "argument from contrary properties". It consists of several main premises.

The first main premise is the fundamental ontological assumption that a nature constitutes the essence (*dhāt*) of its individuals. It is to be considered that "essence" is used in a special sense in this context. It means the reality of a thing or what a thing is. Humanity, for example, is my essence in the sense that it constitutes my reality; I am but the humanity which exists in me. (It is interesting to know that the technical term used by Muslim philosophers for this sense of essence, i.e. "*dhāt*", in ordinary Arabic means: what owns the attributes of a thing.) Thus, the relation between a nature and its individual is one of identity:

John = the humanity which exists in John

As a result of this fundamental ontological assumption, Avicenna holds that for any sentence whose subject designates an individual, if the predicate designates the nature of that individual, then the whole sentence designates a relation of identity, and the sentence is called an "identity statement" (*hamli hu hu*). On the other hand, for any sentence whose subject designates an individual, if the predicate designates an accident of that individual, then the whole sentence designates a relation of possession, and the sentence is called a "possession statement" (*hamli dbu hu*) (See Avicenna, 1959, p.20).

The next main premise is what is sometimes called Leibniz's Law of Indiscernibility of Identicals:

$$\forall x, y(x = y) \rightarrow \forall P(P_x \leftrightarrow P_y)$$

An instantiation of the above law is:

$$\begin{aligned} & \text{John} = \text{the humanity}_1 \text{ which exists in} \\ & \text{John} \rightarrow (P_{\text{John}} \leftrightarrow P_{\text{humanity}_1}) \end{aligned}$$

The next main premise is the evident empirical fact that different individuals of the same kind have different and contrary properties. John, for example, is white, 1.80 meters tall, ignorant, and so on. Mary,



Avicenna's theory of universals against the background of analytic metaphysics. As mentioned earlier, analytic metaphysicians usually divide universals into three types: kinds, properties, and relations. Now, a way of studying Avicenna's view against the background of analytic metaphysics is to examine his ideas about these three types, one by one.

Let us start with kinds. Avicenna refers to kinds by such terms as "natures" (*tabi'ah*), "quiddities" (*mab'yyah*), "natural universals" (*kulli tabi'i*), and "realities" (*baqiqah*) (1953, p.38.). Humanity, horseness, treeness, and animality are examples of natures. (It should be noted that in Avicenna's metaphysics, not only ordinary objects but also tropes have natures. However, for the sake of discussion I only speak of ordinary objects' natures.)

Avicenna admits that there ar

(1970), “unit properties” by Matthews and Cohen (1968), and “tropes” by Williams (1953). Williams coined the term “tropes” for particular properties as a sort of philosophical joke: Santayana, he says, had employed “trope” pointlessly for “essence of an occurrence”. Williams would go him one better and press it into service for “occurrence of an essence” (1953, p.78). Since then this word has become a technical term for particular properties.

Trope theory is a general ontological theory to the effect that among the irreducible entities of the world are such entities as tropes. By itself, it provides no explanations for the to-be-explained phenomena in the problem of universals. For, suppose we grant that there are such entities as particular rednesses which red apples possess. Yet no answer has been given to the question “why do we find red apples similar or agree in attribute and, thereby, call them all ‘red?’” To provide an answer for the above-mentioned question, we must combine trope theory with one of the previously mentioned nominalist theories (resemblance theory or class nominalism). In fact, trope theory is an auxiliary theory, so to speak: By combining it with one of the previously mentioned nominalist theories, we can construct sophisticated nominalist theories that are free from the defects from which previously mentioned nominalist theories suffer.

Some trope nominalists, like Williams and Campbell, combine it with resemblance theory (see Williams, 1953; Campbell, 1891). According to these trope nominalists, we find red objects similar or agree in attribute and, thereby, call them all “red” because

- (i) each of them possesses a particular redness, and
- (ii) their particular rednesses resemble each other.

Some other trope nominalists, like Stout, combine it with class nominalism (see Stout, 1921). According to these trope nominalists, we find red objects similar or agree in attribute and, thereby, call them all “red” because

- (i) each of them possesses a particular redness, and
- (ii) their particular rednesses are members of the same set.

(For an account of how these combined theories can overcome the problems faced by the previously mentioned nominalist theories see Armstrong, 1989, p.125-27).

### 3. The Problem of universals in Avicenna

As stated in the introduction, I will try in this section to study

We know that similar objects are members of the same set, the class nominalist tells us, but we do not know why (see Armstrong, 1989, p.14-7; Quinton, 1957).

Thus, the class nominalist's ontology only consists of particular objects and their sets. Quine, Goodman, and Lewis are among the more important advocates of class nominalism. (For different criticisms of class nominalism see Wolterstorff, 1970, Ch.8; Armstrong, 1989, pp.25-36).

### 2.3. Trope Theory

Up to here, we discussed nominalist theories which deny the existence of properties and relations. According to resemblance theory, there are only particular objects and the resemblances between them. According to class nominalism, there are only particular objects and their sets. Both theories treat properties and relations in reductionist manners: resemblance theory reduces them to relations of resemblance holding between objects; class nominalism reduces them to classes of objects. These theories are called extreme nominalism. In contrast, there is a group of moderate nominalist theories that admit the existence of properties and relations, but regard them every bit as particular as objects themselves. This group of theories is called trope theory<sup>6</sup>. Thus, trope theory stands against extreme nominalism in that it admits the existence of properties and relations; and against realism in that it denies their universality.

The idea that properties of things are particular is an old one and has been espoused by many philosophers throughout the history of western philosophy. According to D.M. Mertz (1996, Ch. IV), variants can be found in the writings of Plato, Aristotle, Boethius, Avicenna, Averroes, Thomas, Scotus, Buridan, Suarez, Leibniz, Husserl, the early Russell, Stout, Cook Wilson, and Strawson. However, it is only a few decades that philosophers have come to see the importance and advantages of this view. The most important representative of this view, in our time, is D.C. Williams (see 1953) and to a lesser degree, Keith Campbell (see 1981). Nowadays, it is one of the most promising theories of universals and lies at the heart of current debates.

Particular properties (and relations) have been given different names by philosophers. In the middle ages, they were called "first accidents". In the twentieth century, they have been called "abstract particulars" by Stout (1921) and Campbell (1981), "perfect particulars" by Bergmann (1967), "concrete properties" by Kung (1967), "cases" by Wolterstorff

each other in respect of color. In their view, there are no shared entities in the world as universals. Thus, the resemblance theorists' ontology only consists of particular objects and their resemblances to one another.

There are two versions of resemblance theory<sup>5</sup>. On one version, the relation of resemblance holds between each two similar objects. On the other version, in each set of similar objects, there is a standard member to which all other members of the set must sufficiently resemble if they are to be members of that set. On this version, the relation of resemblance holds between each member of a set of similar objects and the standard member. (You can find the classical presentation of the latter version in H.H. Price's *Thinking and Experience*, Ch. I.) (For different criticisms of resemblance theory see Russell, 1912, pp.150-151; Armstrong, 1989, pp.49-57).

## 2.2. Class Nominalism

Another nominalist theory which has found many supporters in the analytic tradition is class or set nominalism. This theory was introduced only after set theory had made great developments in logic and mathematics. Modern logicians and mathematicians have discovered many features of sets in the last 150 years. This has enabled nominalists to explain the to-be-explained phenomena in terms of sets and, thus, to eliminate universals from their ontology.

According to class nominalists, we find two objects similar or agree in attribute because they are members of the same set. (It is to be noted that sets are objective entities existing in an infinite number in the world right now.) For example, when two objects are red, it is because both are members of the same set: the set of red objects. On this view, redness is the set of red objects; and to be red is to be a member of this set. Or, humanity is the set of human beings; and to be human is to be a member of this set. (Armstrong has pointed out that class nominalism is a reductionist view; it reduces the universal to (the set of) its individuals (1989, p.11)).

A question may be naturally raised for the class nominalist here: what makes red objects be members of the same set? In other words, what hangs the set of red objects together? The realist answers that red objects are members of the same set because they share the same universal. The resemblance theorist answers that red objects are members of the same set because they resemble each other in respect of color. But the class nominalist answers that it can not be answered, because it is a basic and, hence, unanalyzable fact that red objects are members of the same set.

perhaps, Armstrong who calls it "substance-attribute view" (1989, Ch.5).

Now, let us address the second question, i.e. what is the relationship which connects the universal to its individuals? Historical Plato said that individuals participate in, or imitate, the universal (Plato, 1934, p.348). Frege said that individuals saturate the abstract universal. (We should note that he used a different terminology of "concept" and "object" instead of "universal" and "particular" or "individual" (Frege, 1892). But his view comes to the same thing.) Aristotelian realists believe that universals are concrete entities, namely part of this spatio-temporal world. So quite naturally, they see the relation as one of physical or spatial: in their view, the universal is *located in* the individuals. In contemporary analytic philosophy, philosophers, whether of Platonic or Aristotelian tendency, refer to the relation as "exemplification" or "instantiation". But these descriptions are mostly metaphorical; none of them clarify the nature of the relation satisfactorily.

## 2. Nominalism and Its Main Motivation

In contrast to realists, some other philosophers, called nominalists, deny the existence of universals. They attack realism from different angles. (For different criticisms of realism see Quine 1960, p.209; Strawson, 1959, Ch. V; Donagan, 1963, pp.135-9). But their main reason to reject universals seems to be parsimonious considerations. According to the principle of parsimony, sometimes referred to as "Ockham's Razor", we should prefer a theory against its rivals if, everything else being equal, it postulates fewer entities. Now, the nominalist claims that she can explain the to-be-explained phenomena without postulating such redundant entities as universals. So her theory, she claims, must be preferred to realism. Whereas nominalists agree on the redundancy of universals, they disagree on how to carry out the task of explaining the to-be-explained phenomena without appealing to universals. I present, very briefly, the main nominalist theories offered by analytic metaphysicians.

### 2.1. Resemblance Theory

A group of nominalists claim that they can explain the to-be-explained phenomena with the relation of resemblance. According to resemblance theorists, we find several different objects similar or agree in attribute because they simply resemble each other in some respect. For example, when two apples are both red, it is not because there is a single entity as redness shared by both of them, but only because they simply resemble

3- Relations such as equality and fatherhood. (Loux, 2001, p.23-4)

Notice that in contrast to kinds and properties which are exemplified by single objects, relations are exemplified by groups of objects. The relation of fatherhood, for example, is exemplified by my father and I, your father and you, and other pairs of fathers and sons.

However, I think that these three types can be reduced to one type: property. For, a kind can be thought of as a group of properties. For instance, humanity can be regarded as the group of properties which all human beings have (or according to essentialism, must have) in common. As for relations, we shall see in the last section (the section on Avicenna's view) how a relation can be thought of as a second order property supervening on a first order one.

What is the nature of a universal? And what is its relation to its individuals? Any answer to the latter question depends, in part, on an answer to the former. So I first address the former question. Concerning the nature of universals, there are two main views among realists:

A- Platonic<sup>3</sup> realists hold that universals are abstract entities. They define the abstract entity as an entity which is

- 1- non-temporal,
- 2- non-spatial,
- 3- unchanging, and therefore
- 4- outside the causal chain of the world.<sup>4</sup>

For example, consider the property of whiteness. For the Platonic realist, it is outside time and space, does not change, and so stands in no causal relations to other entities. The most important representative of such a view is perhaps Gotlobe Frege who introduced the concept of "abstract" into analytic philosophy.

B- Aristotelian realists hold that universals are concrete entities. A concrete entity is an entity which is

- 1- temporal
- 2- spatial
- 3- changing, and
- 4- part of the causal chain of the world.

Consider the same example: the property of whiteness. According to the Aristotelian realist, it is where and when its subject is, comes into existence when, at least, one individual exemplifies it and goes out of existence when no individual exemplifies it, and has causal interactions with other entities. (It is interesting to notice that A. D. Armstrong, an important Aristotelian realist, argues that natural laws hold between properties of things (1983)). The main representative of such a view is,

To explain this phenomenon of similarity or attribute agreement and similar phenomena<sup>2</sup>, different theories have been proposed by philosophers. In what follows, I shall try to first present very briefly major theories offered by analytic metaphysicians, and then go on to study Avicenna's view against the background of analytic metaphysics sketched in the first part.

Before beginning my discussion, some points on the methodology employed in this study seem in order. This is a comparative study. In this study, I will compare Avicenna's view with the views of contemporary analytic metaphysicians. To do so, I will first explain the views of contemporary analytic metaphysicians. Then, I will study Avicenna's view, not in its own context, but in the conceptual framework of contemporary analytic metaphysics. So, I will not use medieval Avicennaeian concepts, such as quiddity and its divisions, in the course of my discussion. Nor will I use philosophical terms, such as "universal", in their Avicennaeian senses. But, I will use them in their contemporary analytic senses. In other words, in this study I will not present Avicenna's theory as he formulated it. Rather, I will put some contemporary questions before him and try to retrieve his answers to them. Needless to say, this methodology unavoidably brings some distortion on the way the view in question is reflected.

## 1. Realism

Some philosophers, called realists, hold that the mentioned phenomena can not be adequately explained unless there are entities that can be shared by several different objects. These shared entities are called "universals". On the contrary, the entities which can not be shared by several different objects are called "particulars". According to the realist, whenever two objects are similar or agree in attribute there is a single universal which is shared by both of them. For instance, when two apples are both red it is because there is a single universal, the property of redness, which is shared by both of them. Thus, realists hold that there are two basic categories in the world: 1- universals like redness, humanity, and equality, and 2- particulars like all the sensible things we find around us.

As evident in what has been said, realists usually divide universals into three types:

- 1- Kinds such as humanity and horseness.
- 2- Properties such as redness and wisdom.

## The Problem of Universals in Analytic and Avicenna's Metaphysics<sup>1</sup>

Hashem Morvarid\*

### Abstract

*This paper, mainly aims at making a comparison between analytic metaphysicians' and Avicenna's views on universals. To this end, firstly the major views are briefly surveyed among analytic metaphysicians. Then, Avicenna's views about different types of universals are studied: kinds, properties, and relations. Hopefully it will clarify, where Avicenna stands in the current debate on universals.*

**Keywords:** *universal, particular, kind, property, relation, resemblance, set, trope, nature, accident.*

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### Introduction

Like many other philosophical problems, the problem of universals begins with an everyday experience: the experience of finding several different objects similar or agree in attribute. Frequently, we encounter things which agree in kind; they are all, for example, human beings. Or, we encounter things which agree in property; they are all, for example, red. Or, we encounter groups of things which agree in relation; the members of each group are, for example, equal to one another.

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