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More on Dichotomization: Flip-flops of two mistakes

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The error of false dichotomy is well-known. I have explored the matter in a previous OSSA paper and have argued several points that I will presuppose in this paper. These are:

a. A distinction is not the same thing as a dichotomy.
b. A true dichotomy is a disjunction that is both exclusive and exhaustive. In the symbolism of propositional logic, we would express it as (P v Q) & -(P & Q).
c. There are at least six different ways in which a dichotomy, erected on the basis of a distinction, can be false. These are:
   (i) it can fail to be exhaustive;
   (ii) it can fail to be exclusive;
   (iii) it can both fail to be exclusive and fail to be exhaustive;
   (iv) it can be erected around a term that is ill-construed, confused in some way;
   (v) items to which we wish to apply the categorical distinction can be 'off the spectrum' to which this distinction applies;
   (vi) there may be indeterminacy in the case.

In this paper my main focus will be on problems regarding exhaustiveness. A familiar error may be called the Error of Contrariety. In this error, we misinterpret predicates so as to construct contradictory statements around them whereas in fact, the ordinary language use and meaning of these predicates, correctly understood, yields contrary statements. Examples would be 'ugly/beautiful' and 'safe/dangerous.' In standard usage, contradictory statements must have opposite truth values, whereas contrary statements need not: they can both be false, although they cannot both be true. If two statements are contradictory, the logical principles of Non-Contradiction (not both true at once) and Excluded Middle (no middle, no other possibility than one of these statements) both apply to them. If two statements are contrary, the principle of Excluded Middle does not apply, since there are further possibilities: both the contrary statements may be false and when they are, some other claim will be true.

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There are, of course, many examples illustrating this kind of construction. The following pairs of predicates may be said to be contrary, in the sense just defined:

Ugly, beautiful
Good, evil
Healthy, unhealthy
Wealthy, poor
Theist, atheist
Expressible, inexpressible
Wise, unwise

We may say that a given person is either beautiful or ugly, thinking of these as opposites. For a given item X, the statements 'X is beautiful' and 'X is ugly' cannot both be true, but can both be false. Obviously X can be neither beautiful nor ugly but, rather, moderately attractive. And the same may be said for the other terms just listed. If we mistakenly interpret contrary statements as contradictory, we lapse into the Error of Contrariety. This misunderstanding will be expressed in our formalization, if we choose to formalize two contrary statements so as to represent the one as the logical denial of the other, using P and not-P. Where we have contrary statements, such as 'X is beautiful' and 'X is ugly,' or 'W is healthy' and 'W is unhealthy,' we should formalize so as to avoid any implication that the second statement in the pair is the logical denial (contradictory) of the first. There are really alternatives or 'middles' between healthy and unhealthy; good and evil; safe and unsafe; wealthy and unwealthy; theist and atheist; and so on. Given that these alternatives exist, it is a mistake to construct a dichotomy committing us to an exhaustive disjunction.

Although formal apparatus may be helpful in explaining the nature of the mistake, the Error of Contrariety is not an error in formal logic. I would rather say that the error here is *non-formal* or *pre-formal*; we misrepresent an opposition articulated in ordinary language. Predicates that support contrary statements should not be mistaken for predicates that support contradictory statements; contrary statements are not contradictory statements.

There is, however, a very natural response to allegations of error here, a response that is simplifying and may seem to allow us to apply convenient formal tools without having to take into account borderline cases, qualifications, anomalies, vague or ill-construed terms, and other matters. One might say, well, varying cases may be arranged on a continuum and given any continuum, it is perfectly easy to mark some point on it and say that from that point on, an item is considered to have the property Q and at no point before it does the item have the property Q. (I owe this suggestion to Gurpreet Rattan, who is of course not responsible for the way in which it is developed here.) Every item to be classified will be either Q or not-Q, so that to statements of the type 'X is Q' and 'X is not-Q,' the principles of Non-Contradiction and Excluded Middle will apply. You can see how this could work with 'wealth.' Suppose that we wish to distinguish between those adult Canadians who are wealthy and those who are not; let us stipulate that if a person earns over $200,000 a year, that person is wealthy—and if he or she earns less than $200,000 per year, he or she is not wealthy. Then, on the basis of these stipulations, every Canadian adult will turn out to be wealthy *or not*. We can do a similar

thing with obesity for adults (as, notoriously, is current medical practice): one uses a formula to calculate the Body Mass Index or BMI. If a person's BMI is 30 or more, that person is deemed to be obese; and if it is less than 30, that person is deemed not to be obese. Every adult will be obese *or not*, using this method.

These are proper logical denials, so the Principles of Non-Contradiction and Excluded Middle will apply. Now all of this seems convenient, and may actually be so for some purposes. We could use a rather similar method to handle some of the earlier examples too—though for complex notions such as 'health' and 'safety' some fancy manoeuvring and operationalization will be required. But if we quantify risk or enumerate diseases, and set up a continuum marking degrees of safety or degrees of health, we can specify a cut-off point at which X will be safe, or healthy. Then, up to that point, by definition, X will fail to have these qualities and will be unsafe, or unhealthy, as the case may be.

Designate the predicate in question as Q, and suppose that it has some descriptive content; we can say that we understand, and can give an account of, what it is to be Q. Now using the cut-off approach, we construct a dichotomy. Every item we categorize will be either Q or not-Q and no item will be both. These provisions will give us a *true dichotomy*.

But now a different problem arises. When we form a dichotomous construction in this way, I want to argue that we lapse into another error, one that I will refer to as the Error of Vacuity. What happens here? There is the problem is that whereas Q is a positively defined predicate, 'not-Q' will have remarkably little content. To describe an item X as 'not-Q' is not to say what X is or is like; it is only to say what X is *not*. A 'not-Q' predicate offers a highly superficial description at best. In fact, the statement 'Either X is Q or it is not Q' is arguably one that is *quasi-logical*, in Perelman's sense. Such a statement has a basic logical structure but it is spuriously informative due to the vacuity of one of its disjuncts. We encounter here what Dewey referred to as the infinite negative; just about every possibility is left open for X if we stipulate that X is not-Q. We can say, for instance, that a man is either handsome or *he is not handsome*. Obviously, though, to say that some man is not handsome is to say little about him: a man not handsome might be attractive, slightly attractive, rather ugly but with some attractive features, extremely ugly, and so on.

Here's what happens. We think in falsely dichotomous terms if we assert that a man is either handsome or ugly. We commit the Error of Contrariety in constructing this dichotomy, because we have constructed, around our categories, contradictory propositions when in fact we should have constructed contrary ones. Now if we are charged with constructing a false dichotomy in some context like this, we can remedy the problem and rescue ourselves from charges of the Error of Contrariety. It seems easy; we just construct our dichotomy around a Q and not-Q construction, carefully defining Q and not-Q by marking a kind of cut-off point on a continuum. We do not say that the man is not handsome or ugly; rather we say that he is handsome *or not*. Now at this point, I submit, we lapse into a distinct and possibly more subtle error, one that I will refer to as the Error of Vacuity. [1] The negative side of the dichotomy is vacuous, indicating only the infinite negative.

The sense in which the negative is infinite is that it can include anything and everything—except, of course, exactly those items that fall in the original category. Consider another example now: the distinction between male and not-male. There are various quite distinct ways of not being male. A person might, for instance, be female—which for human beings is the standard way of not being male. (It has been thought—that a woman is a not-man; Aristotle somewhere said, "a woman is defined by a certain lack.") The problem here is that the 'lack' defines too large a category to be filled by females alone, since there are many 'non-males' who fail to count as female. An animal might be non-male because it is self-reproducing and for biological purposes not correctly described either as male or as female. A person might be, or be counted as, non-male due to hermaphroditism or trans-sexuality or the presence of only some of the standard male organs or typically masculine hormones, or being pregnant, or giving birth. In 2008 a trans-sexual person who had been born female and become male maintained his/her ovaries, uterus, and vagina after surgery; this person was impregnated, and gave birth to a child. Was this person a pregnant man? A man who gave birth? That's how the case was publicized. The description is contestable, but I think that only serves to support my point.

Now we might stipulate a criterion of maleness, providing a cut-off point. (No pun intended!) We might say: such and such is male, and all the rest is female; the not-male is female; therefore given that every creature is male or not male, every creature is male or female, and the dichotomy male/female is thereby established. Such a categorial structure can obviously be devised and will seem to provide a simple and clear theory and correlative practice. If you doubt it, the possibility is proven by an actuality: this practice does in fact exist and 'inter-sex' infants are labelled and give surgery so as to make them male or female. Ignoring complications of brain, enzyme, and hormonal factors, in much North American medical practice, if a human infant with mixed or ambiguous sexual organs has a penis that is *more than two centimetres in length*, that infant is deemed to be male and surgically adapted to be a more standard specimen of maleness. If the infant's penis is *less than two centimetres in length*, that infant is deemed not to be male and to be, by default and falsely dichotomous reasoning female—and as a practical matter, this infant will be surgically reconstructed and socialized as such. Bifurcation is thereby achieved: the penis is either two centimetres long or it is not and, correspondingly, every new-born infant will be male or not. Medical personnel make the stipulation and surgery is used to construct the dichotomy, which is enforced at enormous emotional cost to some intersex individuals.

From a logical point of view, here's what I think is going on. If you first insist that for human beings, *male or female* constructs a dichotomy, you are open to attack on the grounds you have committed the Error of Contrariety. If you secondly insist that for human beings, every one is *male or not-male*, you seem to be on firm and solid logical ground because you have avoided that mistake of contrariety. But you have then, I argue, incorporated into your assertion into the Error of Vacuity. To give content to your second assertion, you need to respond to the question 'what is the 'not-male.'' When you supply this content, you find an interesting variety of cases. At this point you will either lapse back into the Error of Contrariety or rescue yourself from the temptations of dichotomy.

This thought pattern is a common one, I think. Trying to avoid Contrariety, we lapse into Vacuity. To save ourselves from Vacuity, we may return to Contrariety.

Better—we fill in content, we appreciate complexity going beyond the binary classification, and cure ourselves of the temptations of binary thinking about the topic at hand.

Here is another illustration, this time from the philosophy of argument itself. Consider the matter of deductive and inductive arguments. It is quite common to define "inductive" as "non-deductive"—you will no doubt be familiar with the move, which is quite standard but offers remarkably little guidance as to what it is for an argument to be inductive. Responding to this problem, a theorist might give some independent meaning to the term "inductive," defining it for instance in terms of empirical generalization, samples and populations, or reasoning from experienced cases to inexperienced ones on the assumption that the latter will resemble the former. If that is done, and a distinct meaning is also given to the term "deductive," then "deductive" and "inductive" will be contrary predicates and will not support a dichotomous classificatory system. Within such a scheme, many arguments will turn out to be neither inductive nor deductive. Exhaustiveness will fail because there are alternatives. These will include abductive arguments, analogy arguments based on consistency principles, empirical or inductive analogies, conductive arguments, and (possibly) other types.

In other words, if the predicates 'inductive' and 'deductive' are defined independently of each other, then the 'inductive/deductive' distinction does not yield a dichotomous classification of arguments. To think that they do is to commit the Error of Contrariety. The contraries are falsely construed as contradictories, and the disjunction is false because it is not exhaustive; relevant cases are omitted. If these predicates are defined inter-dependently, through a definition of "inductive" as "non-deductive" we do establish an exhaustive and exclusive binary classification, but there is little or no content to the "non-deductive" description. As in the male/female case, we are likely to vacillate between two errors: those of Contrariety and Vacuity. If you define "inductive" as "non-deductive," you will in so doing be able to support the conclusion that every argument is either deductive or inductive. Clearly you can insist that every argument is either deductive *or not*, and if it is *not*, then it is by definition inductive. But you are not saying much about an argument when you say it is in this sense inductive. The category has little content. I argue that this move incorporates the Error of Vacuity. Again, to avoid it, you may revert to Contrariety incorporating a false supposition of exhaustiveness, or you may fill in content, appreciate the relevant diversity in the vacuous negative, and leave the dichotomy altogether. (To avoid mistakes, that move is preferable.)

I have spoken here of a continuum of cases. But the continuum metaphor itself is a simplifying metaphor. Sometimes the models of *continuum* and *spectrum* are inapplicable. Interestingly, one such instance appears to be that of argument typology. Stephen N. Thomas once spoke of a *spectrum* pertaining to argument strength and, echoing his language, some persons including myself have discussed a Spectrum Theory of argument. According to such a theory, argument strength is not an all-or-nothing matter where deductive validity is the 'all' and everything else counts as 'nothing.' Some arguments would be stronger and others weaker; the language of spectrum connotes degrees and locations along a continuum or spectrum of strength. A Spectrum Theory seems like a significant advance over the alternative of simple deductivism and also over the binary theory that what is fundamental in argument is the 'great divide' between deductive and inductive.

But how, exactly, are we to understand this supposed spectrum? We have landed here in the territory of metaphor. We think of one end of the spectrum as indicating deductive validity, and then we will have *degrees of strength* as we shift away from that. Now all of this seems quite reasonable. But when you think about it further, difficulties arise. A fundamental problem is that deductive validity really *is* an all-or-nothing matter, and *not* susceptible of degrees. We need to ask, accordingly, of *what* are these *degrees*, on the spectrum or continuum? There seems to be no good answer to this question. A fundamental problem is that at least some relevant differences would seem to be differences of *kind*, not differences of *degree*. If, for example, we were asked to compare the degrees of strength of, say, abductive arguments and conductive arguments it is hard to see how these could be placed on a spectrum. The question as to which belongs in a 'stronger' area on a single spectrum of strength seems to be misconstrued.

When this point is understood, the issue of the infinite negative begins to seem especially difficult. When there are differences of kind, the problem is not that of marking off some part of a continuum, leaving 'not-Q' on the continuum as an infinite negative. Rather, it is that there is no continuum in the first place.

Here is another example. A committee on which I served was working to improve the funding and status of those subjects taught at my university that were *not sciences*. For practical reasons, we were functioning on this committee within a binary classificatory system: either a subject is a science or it is not. The subjects that are not science are, of course, many: history, literature, languages, philosophy, religious studies, management, drama, music, art, education, physical education, and more. Obviously these so-called 'non-sciences' are highly diverse. We could try to give the negative more content and specificity; for example, we might substitute a more content-rich dichotomy, saying for instance that every subject is either science or a humanities discipline. But doing this has us committing the Error of Contrariety: exhaustive fails because there are clearly subjects such as management and music that count neither as one of the sciences nor (in any straightforward way) as one of the humanities. Or we could simply use the category 'non-science;' every subject, we may say, is either a science or *not*. But what does this tell us? We arrive again in the territory of Vacuity.

This case is like that of 'inductive/deductive' in that the continuum notion does not apply. Management, fine arts, literature, philosophy, mathematics, and drama differ from science and from each other in many diverse ways, and these differences are not usefully considered to be differences of degree. We cannot simply construct a continuum and stipulate a cut-off point for 'science' because the differences themselves are diverse in relevant ways. The study of history is different in kind from the study of physics and chemistry and then, again, from the study of philosophy and mathematics.

My point will, I hope, be clear. But I cannot resist one further illustration. This is the matter of theism and atheism, and I owe my interest to dichotomization in the context of this particular context to my former student, Colin Hirano. Stipulate that a *theist* is one who believes in a god or gods, defining the god or gods as supernatural entities believed to play a key role in creating the universe. Is everyone, then, either a *theist* or an *atheist*? You might think so—but not for long. Exhaustive fails. We must recall the distinction between agnostics and atheists, paralleling the distinction between doubt and denial. Agnostics *doubt* whether a god or gods exist and may wonder about the matter, even taking great interest in it, whereas atheists *deny* the existence of a god or gods. Thus the

dichotomy 'theist or atheist' is a false one, one that will not tempt you for long. We commonly define at least three categories relevant to religious belief: namely theist, agnostic, atheist. You will easily see that anyone who constructs this dichotomy (often a highly polarizing dichotomy, presuming exhaustiveness, and, for some, facilitates demonization of the atheist) has committed the Error of Contrariety. Let us now seek to rectify the problem of non-exhaustiveness by defining the term "theist" and then claiming that everyone is either a theist or *not*. We can do that. We now have a binary classificatory system around which we can construct true dichotomies. But the negatively defined category is vacuous, misleading, and useless for many purposes. It will include agnostics, atheists, sceptics, Buddhists, animists, pantheists—and possibly others. Try to fix this error of Vacuity: you will either revert to Contrariety or leave the dichotomy.

This is another instance in which the continuum metaphor is misleading. We might begin to conceptualize some of these differences along a continuum of *degrees* of faith or belief (that might work for theist/agnostic/atheist) or of the *number* of 'standard' theistic beliefs shared. But elsewhere the differences are more plausibly seen as differences in content that are more like differences of kind. Given that Spinoza writes constantly of God, many modern readers find it strange and curious that he was branded an atheist. As a matter of historical fact, Spinoza was notorious for his atheism, and (even in the eighteenth century of supposed enlightenment) one of the worst things that could be said of a philosopher was that he was a Spinozist. The explanation for this categorization of Spinoza's views lies in the fact that the God of Spinoza was not construed as transcendent or supernatural; Spinoza's God was not to be distinguished from Nature itself and was, accordingly, not the God of Christian theism, about whom such philosophers as Locke, Descartes, and Leibniz were articulating philosophical and theological arguments. The conceptual misfit is radical and for that reason it is incorrect to call Spinoza an agnostic, atheist, or theist. If we were to place Spinoza on a spectrum of *degrees of confidence* about the metaphysical source of the given universe, he would appropriately be classified with dogmatic theists and militant atheists, given the tones of rationalist certainty in his writings. But this sort of continuum classification offers no illumination with regard to the *content* of his views. Spinoza is neither a theist nor an atheist nor an agnostic; he is better described as a pantheist whose views might usefully be compared with those of Buddhism.

To return to my theme of dichotomization, I am claiming that there is a characteristic sequence of thought with regard to opposite predicates. We easily commit the Error of Contrariety and then, when we seek to correct our mistake, we fall instead into the Error of Vacuity. When we appreciate the emptiness of the negative and try to escape Vacuity, we either fall back into Contrariety or escape the dichotomy altogether, having come to understand relevant differences between the items we are seeking to classify. That understanding upsets the original dichotomy. Instead of male/female, we will have male, female, trans-sexual, transgendered, inter-sex, hermaphroditic. Instead of deductive/inductive, we will have deductive, inductive, analogical, abductive, conductive. Instead of theist/atheist, we will have theist, atheist, agnostic, pantheist, and so on.

I submit, then, that by probing the Errors of Contrariety and Vacuity, we can escape the pitfalls of dichotomization and understand just why the mistakes we so easily make really are mistakes.

OBJECTIONS CONSIDERED

1. *You have talked only about the need to fill in the negative; in fact, often both sides of a purported dichotomy will need to be filled in. This is apparent from some of the examples; for instance, there are sciences that differ relevantly from each other, there are different ways of being a theist, and there are different types of deductive argument. When what seems to be a dichotomy dissolves on analysis, both sides dissolve, not just one.*

Response: The point is granted, but does not upset the analysis given here.

2. *Sometimes the fundamental division between Q and not-Q is what is really important in practice, and the sub-divisions you insist on don't matter as much. In these cases there remains a sense in which the dichotomy is defensible and correct. For example, if those subjects that qualify as science receive vastly more funding than the others and a committee is charged with trying to rectify that situation, then the science/non-science distinction is central for the purpose at hand and the similarities that exist between the non-sciences are in this context far more important than the differences between them. Pragmatically, then, some dichotomies that are in the strict sense false are useful and defensible as such. Degrees of Q and not-Q, respects in which X qualifies as Q or does not, and even kinds of Q and not-Q may not actually matter for the purpose at hand. If this is the case, then a dichotomous classificatory framework will be the most convenient one.*

Response: If this is really the case, then the dichotomous framework is defensible in such a context, but we should not forget that it is an over-simplifying framework that glosses over factors that may turn out to be significant after all.

3. *The complexity when you fill in both for Q and for not-Q is going to be intolerable. You cannot usefully classify into many, many categories. Even though two is a small number of fundamental categories, this small number,* two*, may be exactly the number that you need.*

Response: In many areas we recognize and deal with complexity, demonstrating that we have a capacity to understand and apply more subtle distinctions and refined categories.

4. *Putnam has indeed said that a distinction is not yet a dichotomy, but the fact that he said it doesn't mean that he was right. If you keep on resisting dichotomies you will end up resisting distinctions and, through this, meaningfulness itself, which will put you in a position of absurdity.*

Response: Putnam was quite right and the point should be easy to see. Consider: we can clearly distinguish blue from green without positing a false dichotomy based on the

blue/green distinction. To say that blue is distinct from green is to say that *nothing is both blue and green at the same time and in the same respect*. 'Not both' in this sense gives qualified exclusivity. It does not give exhaustiveness and thus cannot support any inclusive disjunction between being blue and being green. To say that blue is distinct from green is not yet to say that everything must be either blue or green (that there is no alternative colour), which would be required for a dichotomous classificatory system based on the blue and the green.

5. *Your own exposition employs binaries, as for instance when you distinguish between differences of degree and differences of kind, and between the Error of Contrariety and the Error of Vacuity. Because you resist binaries and nevertheless, want to employ them, your analysis is inconsistent and, ultimately, self-refuting.*

Response: This analysis can preserve distinctions, as explained above. We can say that there are differences of degree and of kind, and that these are to be distinguished, without saying that every difference must be either one of degree or one of kind. Similarly, we can distinguish the errors of Contrariety and Vacuity without saying that every error—or even every error with regard to dichotomization—must either be one of Contrariety or one of Vacuity.

6. *The binary is highly natural to us, and resisting it is asking too much and is futile. Dialogue and conversation will 'naturally' give you opposites as they are conducted in a for-and-against way, which requires two sides. You may say, 'two is a small number,' but it is for human beings in dialogue and conversation just the right number; it is the best and most natural number for human discussion and thought.*

Response: Not all conversations are of an 'I versus you' type, which is in form oppositional and potentially adversarial. We may converse by exchanging narratives and information, exploring possibilities, and so on and so forth. Even when conversation involves criticism, that criticism can be refined and qualified so as not to generate a situation of one side versus another.

7. *You are going to go so far that you will wind up being a post-modernist, which will be terrible!*

Response: To explore how and why it would happen and would be terrible would be a large task indeed and only some preliminary themes can be mentioned here. Although post-modernists do oppose dichotomies, it does not follow that anybody who opposes dichotomies is, or is on the road to becoming, a post-modernist. But in any event, it should be obvious that this theory lacks many of the trappings of post-modernism. There is no resistance to distinction, negation, fixed meanings, or objectivity. Rather there is an insistence on context and relevant differences.

Link to commentary

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