7.3.3. *Any* and *every*

We will conclude with some issues concerning the word *any*. It was noted in 3.1.3 that this word should be replaced (usually by *some*) when a sentence is analyzed as truth functional compound. Thus *Tom didn't see anything* becomes ¬ *Tom saw something* and *If anyone backs out the trip will be canceled* becomes *Someone will back out* → *the trip will be canceled*. But sentences containing *any* can—in most cases— also be understood to state direct affirmative generalizations and can be analyzed using a universal quantifier as the main logical operation. When they are seen in this way, the truth-functional structure that appears to give the overall form of the sentence will be confined to the quantified predicate. Thus the examples above could be analyzed as follows:

Tom didn't see anything
Everything is such that (Tom didn't see it)
∀x (*Tom didn't see* x)
∀x ¬ *Tom saw* x
∀x ¬ Stx
[S: λxy (x *saw* y); t: *Tom*]

If anyone backs out, the trip will be canceled
Everyone is such that (if he or she backs out, the trip will be canceled)
(∀x: x *is a person*) (*if* x *backs out, the trip will be canceled*)
(∀x: Px) (x *will back out* → *the trip will be canceled*)
(∀x: Px) (Bx → Ct)
∀x (Px → (Bx → Ct))
[B: λx (x *will back out*); C: λx (x *will be canceled*); P: λx (x *is a person*); t: *the trip*]

These analyses are, for the time being at least, preferable to analyses as truth-functional compounds since we do not yet have a perspicuous way of analyzing quantifier phrases containing *some*.

The indefinite article *a* is interchangeable with *any* in many cases like these—e.g., *Tom didn't see a thing*—so they constitute another sort of case (on top of those noted in 7.3.1) in which *a* may be used to state a generalization. (It's also true that *any* is interchangeable with *a* in many cases like those noted in 7.3.1—e.g., *Any dog likes bones*.) But *a* cannot be used very successfully

in place of *any* in the second example above. Something like *If even one person backs out, the trip will be canceled* does work, but that is comparable to replacing *anyone* by *someone*.

It would be grammatical to put *every* in place of *any* in the examples above; but the meaning would be quite different, and the new meaning could be captured only by an analysis as truth-functional compounds:

Tom didn't see everything
¬ *Tom saw everything*
¬ ∀x (*Tom saw* x)
¬ ∀x Stx
[S: λxy (x saw y); t: *Tom*]

If everyone backs out, the trip will be canceled
everyone will back out → *the trip will be canceled*
(∀x: x *is a person*) x *will back out* → *the trip will be canceled*
(∀x: Px) Bx → Ct
∀x (Px → Bx) → Ct
[B: λx (x *will back out*); C: λx (x *will be canceled*); P: λx (x *is a person*); t: *the trip*]

These two sets of examples can be generalized to a rule of thumb: in contexts where *any* and *every* convey a different meaning, the significance of *any* can be captured by a generalization having a scope wider than some other operator while the significance of *every* will be captured by generalization having a scope narrower than this operator. The contexts in the examples above, negations and the antecedents of conditionals, are the most common ones where *any* and *every* convey different meanings; but we will encounter another in in the next sections. Contexts like these (along with some others where the operators are not ones we will study) are the chief contexts in which *any* can be used grammatically. Thus *any* can seem to avoid a potential ambiguity in the relative scope of generalization and other operations.

When operators of the relevant sorts are stacked up, *any* tends to mark wider scope than only the one of them with narrowest scope. For example, on its most natural interpretation,

If Tom didn't find anything, he was disappointed

amounts to

If everything is such that Tom didn't find it, he was disappointed

so the generalization has a scope wider than the negation but narrower than the conditional. There is a way of expressing a generalization with widest scope using *any*:

If there is anything that Tom didn't find, he was disappointed

We will look at the phrase *there is* in 8.1. For now, it is enough to note that it permits us to use the relative clause *that Tom didn't find*; this serves grammatically to give *any* wider scope than the negation, so the ability of *any* to assume a scope wider than some operation is held in reserve for the conditional.

There are other cases where we cannot analyze a sentence containing *any* as a truth functional compound even if we replace *any* by *some*. For example, *If Alex hears anything, he'll tell us about it* cannot be analyzed as a conditional because replacing the pronoun *it* by its antecedent would change the meaning; while it is not clear what claim is being made by *If Alex hears anything, he'll tell us about anything*, it is clear that it differs in meaning from the original sentence—as does *If Alex hears something, he'll tell us about something*. This means that we cannot get around the following analysis:

Everything is such that (if Alex hears it, he'll tell us about it)

∀x (*if Alex hears* x, *he'll tell us about* x)

∀x (*Alex will hear* x → *Alex will tell us about* x)

∀x (Hax → Tasx)

[H: λxy (x *will hear* y); T: λxyz (x *will tell* y *about* z); a: *Alex*; s: *us*]

Notice that this form is the restatement using an unrestricted universal of the restricted universal quantification (∀x: Hax) Tasx. The latter symbolic form could turn up as the analysis of the sentence *Alex will tell us about anything he hears*, and this is a case where the word *any* cannot be replaced by *some* without changing the meaning (try it). In our original example, this replacement is possible (at least in colloquial speech), but it employs an exceptional use of *some*. The sentence we get—namely, *If Alex hears something, he'll tell us about it*—is used to state a generalization, not to claim the existence of an example.

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