The Definiteness
of Manners and Reasons

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1 Introduction

As social scientists and airplane crash investigators must occasionally point out, almost nothing happens for only one reason. No plane ever crashed *just* because it was snowing or *just* because the pilot forgot to de-ice the wings, for example. It's only the conjunction of such factors that can provide an explanation. Fittingly, it's a mild insult to describe an explanation as 'monocausal'. That's because we recognize that the search for sole causes is naïve and often necessarily unrequited.

Despite all this, the linguistic choices we make often suggest sole causes, and it would be pedantic to object to that wording:

(1)   a. What is <u>the reason</u> Floyd left?
        b. <u>The reason</u> for Floyd's departure was a menacing swarm of bees.

        c. <u>The reason</u> for Floyd's departure is $\left\{ \begin{array}{l} \text{that} \\ \text{?because} \end{array} \right\}$ he was pursued by
           a menacing swarm of bees.

Superficially, the definite description *the reason* would seem to require a sole cause because definite descriptions generally require a unique referent. But even if Floyd is pursued by bees, he doesn't have *only* one reason to leave. For one thing, he is also leaving because of not just the whole swarm but

also because of various sub-pluralities of bees that make up the swarm. After all, a single menacing bee can be enough to trigger retreat. The point isn't trivial. The sentence is about what one might call a maximal reason, and that maximality has to come from somewhere. The only definite description present is *the reason*, and it's headed by a singular count noun. But the maximal interpretation of definite descriptions normally arises only with plural and mass nouns. Even setting this issue aside, there must be other reasons for Floyd's departure, ones unrelated to the part structure of the swarm. At the risk of blaming the victim, he may well have *done* something to invite the wrath of the bees—perhaps poking their hive, say—and that too is a reason for his departure. Had it not happened, there would be no swarm.

The generalization seems to be that one can refer to *the reason* for an event without giving rise to the entailment that there is only one reason. That requires explanation.

It's not just reasons that work this way. Manners do too.[1] For example, just as one might ask about the reason for something, one can also ask for a manner in which it was done:

(2)   a. What is the way (in which) Floyd ran?

b. The way (in which) Floyd ran was $\left\{ \begin{array}{l} \text{by taking huge strides} \\ \text{on his tiptoes} \\ {}^{?}\text{quickly} \\ {}^{?}\text{as fast as he could go} \end{array} \right\}$.

There is some syntactic awkwardness around putting an adverbial in predicate position in (2), but the general shape of the puzzle is the same as in (1). If Floyd ran by taking huge strides, he may have also run ridiculously or awkwardly, and saying that he ran in one of these ways doesn't give rise to the inference that he didn't also run in the other ways as well.

This squib suggests a way of looking at these facts. Section 2 illustrates the effect more fully, focusing on paradoxical behavior with respect to cardinality. Section 3 observes similar behavior in more familiar content-bearing nouns. Section 4 proposes a semantics for certain *reason* and *way* sentences on the basis of this kinship. Section 5 provides the analytical payoff, noting how the these assumptions collectively explain how definiteness works in reason and manner descriptions.

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[1]Locations may also work in something like this way, but I'll set them aside for brevity.

2   Manners and reasons and the Paradoxical Cardinality Property

It's certainly not the case that reasons or manners are obligatorily singular or expressed with definite descriptions:

(3)   a. $\left\{\begin{array}{l}\text{A}\\\text{One}\\\text{The (main)}\end{array}\right\}$ reason Floyd ran was fear.

       b. $\left\{\begin{array}{l}\text{A}\\\text{One}\\\text{The (main)}\end{array}\right\}$ way in which Floyd ran was by taking huge strides.

All the forms in (3) give rise to the implicature that there were additional reasons apart from the one mentioned. This can made an entailment as well:

(4)   a. He ran for two reasons: first, the swarm of bees, and second, the pack of hungry wolves.
       b. He ran in two ways: taking huge strides and bouncing from side to side.

Even quantification is possible:

(5)   a. He ran in every way I did.
       b. He ran in most ways I could think of.
       c. There is no way he can run (without injury).

Interestingly, *no way* is conventionalized to express emphatic negation. Omitting *without injury* from (5c) would tend to convey that he definitely can't run at all.

    One striking property of ways and reasons is that they're hard to individuate. No matter what the facts of the matter are, it's hard to determine whether Floyd ran in one way or two or twelve. Likewise for reasons. That's true conceptually, but it's also clearly reflected linguistically. As far as I can see, (6a) and (6b) have the same truth conditions:

(6)   a. He ran for two reasons: first, the swarm of bees, and second, the pack of hungry wolves.
       b. He ran for precisely one reason: the creatures pursuing him.

That's also the case for their manner counterparts:

(7) a. He ran in two ways: taking huge strides and bouncing from side to side.
     b. He ran in precisely one way: taking huge strides while bouncing from side to side.

There is an interesting side issue in (7) having to do with whether the manners are interpreted as describing a single event simultaneously or two distinct subevents. But this is an orthogonal feature this particular example. Apparently, salsa dancing comes in two varieties, Puerto Rican and Cuban, which leads to sentences like these:

(8) a. He danced in two ways: the Puerto Rican salsa and the Cuban salsa.
     b. He danced in precisely one way: the salsa.

These can describe the same dancing event.

This difficulty of individuation is a special property of reasons and manners, and my suspicion is that it's the crucial one that explains their odd behavior with respect to definiteness. Fundamentally, there is no difference between two reasons and a single reason. More than that, they are cumulative, which is surprising for a notion expressed with a singular count noun. To lay this out a bit more fully, the extension of a singular count noun is not cumulative because the sum of any two objects in it is not also in it. Floyd and Clyde might both be in the extension of *linguist*, but their sum, the plural individual consisting of the two of them together, is not in the extension of *linguist*. But it is, of course, in the extension of *linguists*. And the extension of plural nouns *is* cumulative, because any two pluralities in the extension of *linguist* can be summed to make a new plurality that is in the extension of *linguists*. Mass nouns are similar: any two quantities in the extension of *water* can be summed to yield another quantity in the extension of *water*.

But that's not how manners and reasons work. One reason Floyd is running may be the angry bees. Another is the hungry wolves. Together, they are two reasons for him to run. It's therefore apparently enigmatic and surprising that together, they are also a single reason for him to run. That's true of manners as well. If Floyd is running taking huge strides and bouncing from side two side, these are two ways in which he's running, but they are also *the* way in which he's running.

For the sake of having a label, I'll call this the Paradoxical Cardinality Property of reasons and manners:

(9) **Paradoxical Cardinality Property**

The same event can be said to have a single reason, or arbitrarily many, and a single manner or way, or arbitrarily many.

The hypothesis we have arrived at links this to cumulativity:

(10) **Cumulativity Generalization**

The Paradoxical Cardinality Property arises for a singular noun N iff N is cumulative; that is, iff for any x and y in $[\![\,N\,]\!]$, the mereological sum of x and y is also in $[\![\,N\,]\!]$.

Any noun with this property would suspiciously resemble a plural or mass noun. But this shouldn't be alarming, and in some sense it's inevitable. Szabolcsi & Zwarts (1993) implicitly reach a similar conclusion for manners.

3 The wider world of paradoxical cardinality

As might be expected, *way*, *reason*, and their synonyms are not the only nouns with the Paradoxical Cardinality Property. There are various potential candidates for others, but a large class that presents itself is nouns that, it has been claimed, have propositional content, in the sense of Moulton (2009) and many others subsequently.

Idea is one such noun. First, the sense in which *idea* has propositional content is that, although it behaves compositionally like an individual, any idea is necessarily an idea *about* something. The usual properties we expect nouns to have are also properties of *idea*—it can occur in both singular and plural forms, with a wide range of quantifiers, and in a wide range of nominal contexts. Treating it as having individuals in its extension therefore makes sense. But any given idea is an idea that something is the case. That's reflected in predicative sentences:

(11) Floyd's idea was that he shouldn't poke beehives anymore.

Not poking beehives can be said to be the propositional *content* of Floyd's idea.

Many other nouns denote properties of individuals with propositional content:

(12) Floyd's $\begin{Bmatrix} \text{belief} \\ \text{thought} \\ \text{claim} \\ \text{assertion} \\ \text{allegation} \\ \text{accusation} \\ \text{suggestion} \end{Bmatrix}$ was that he shouldn't poke beehives anymore.

All of these have the Paradoxical Cardinality Property. There is a natural way of summing propositional content: with logical conjunction. The sum of the proposition that he shouldn't poke beehives anymore and that he shouldn't provoke wolves is a single proposition: that he shouldn't do one and he shouldn't do the other. If both of these propositions are beliefs of his, it's also necessarily the case that the conjunction of the two is a belief of his.[2] That's the case for all the content-bearing nouns in (12).

For the sake of explicitness, let's suppose that there is a sort of individual that is in the domain of a function, **content**, that maps individuals to their propositional content. It's therefore a function of type $\langle e, st \rangle$. An example:

(13)   a. Floyd's idea was that he shouldn't poke beehives.

   b. $\textbf{content}\left(\iota x \begin{bmatrix} \textbf{idea}(x) \, \wedge \\ \textbf{Floyd's}(x) \end{bmatrix} \right) = \lambda w \begin{bmatrix} \text{Floyd shouldn't poke} \\ \text{beehives in } w \end{bmatrix}$

Of course, it's also sometimes necessary to determine the individual that has certain propositional content—the nominalized proposition, in the lingo. I'll indicate the latter with a function **individual-counterpart**, of type $\langle st, e \rangle$:

(14)   a. The idea that Floyd shouldn't poke beehives is wise.

   b. $\textbf{wise}\left(\textbf{individual-counterpart}\left(\lambda w \begin{bmatrix} \text{Floyd shouldn't poke} \\ \text{beehives in } w \end{bmatrix} \right) \right)$

With this in place, a sum operation for content, $\oplus_c$, can be defined:

(15) $x \oplus_c y \overset{\text{def}}{=} \textbf{individual-counterpart}\left(\lambda w \begin{bmatrix} \textbf{content}(x)(w) \, \wedge \\ \textbf{content}(y)(w)) \end{bmatrix} \right)$

This says that the content sum of two individuals is the individual counterpart of the logical conjunction of their contents. For example, the content sum of

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[2]As a linguistic matter, in any case, this seems to be how we use nouns like *belief*. There is a philosophical debate about whether we all know the logical consequences of our beliefs. This is referred to as 'epistemic closure' (Luper 2020), a term since hijacked to describe isolated political media bubbles. I'm not sure to what extent the linguistic and philosophical issues here can be related.

the idea that Floyd shouldn't poke beehives and the idea is that he shouldn't antagonize snakes is the idea that he should do neither of these things. It's slightly more elegant to state this in terms of sets as in (16), and this strategy will prove useful in a moment:

(16) $x \oplus_c y \stackrel{\text{def}}{=} \textbf{individual-counterpart}(\textbf{content}(x) \cap \textbf{content}(y))$

Of course, the content sum operation will not displace its more familiar cousins. We still need the classic Link (1983) sum operations, including the individual sum operation that combines singular (i.e., atomic) individuals to create plural individuals and the mass sum operation that combines bits of stuff in the extension of a mass noun to create larger agglomerations of stuff.

4   Manners, reasons, and contents

That's all entirely independent from reasons and manners, so it remains to be seen whether these ideas will help. The notion of propositional content instantly makes sense of sentences like (17a), which can be represented as in (17b), along the same lines as content copular sentences like (13):[3]

(17)   a. The reason for Floyd's flight is that he was pursued by a swarm of bees.
        b. $\textbf{content}(\iota x[\textbf{reason}(\textbf{Floyd's-flight}])(x)]) =$
                                       $\lambda w[\text{Floyd was pursued by bees in } w]$

Manners can be treated analogously, with one small twist. The content of nouns like *manner* or *way* isn't a proposition. It's, well, a *manner*, a way of doing something. The standard way of construing manners since Davidson (1967) is to regard them as properties of events. The natural move, then, is to regard the content of nouns like *way* as properties of events. Thus:

(18)   a. The way Floyd fled is by taking huge strides.
        b. $\textbf{content}(\iota x[\textbf{way}(\textbf{Floyd's-flight})(x)]) =$
                                       $\lambda e[\text{Floyd took huge strides in } e]$

This is, in a sense, unsurprising. If events and worlds are both understood as species of situation in the Kratzer (1989) way, these two types of content are actually two sides of the same coin. The intersective semantics above for the content sum operation $\oplus_c$ already makes possible summing content of this type.

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[3]The constant **Floyd's-flight** has as its value the property of events of Floyd fleeing, or perhaps its individual counterpart.

From all this, it also follows that manners and reasons are cumulative, in the sense that the sum of two reasons is itself a reason and likewise for manners. That's because the relevant sum operation is content sum, which is structured to give rise to this through the intersective semantics of summing content.

5   The analytical payoff

But our aim was not to simply represent copular content sentences, but to explain the Paradoxical Cardinality Property and the unexpected definiteness of manner and reason DPs. These follow from the introduction of the content sum operation. Maximal interpretations of plural definite descriptions arise from the fact that, with plurals, *the* picks out the maximal plural individual in the extension of the noun—strictly, its supremum. For the sake of explicitness, I'll write this with **sup**. But before finding the maximal individual in a predicate's extension, it has to be clear what sort of individuals are involved. If its extension consists of plural individuals, it's the maximal individual constructed with the usual individual sum operation, which I'll write $\mathbf{sup}_i$. If its extension consists of mass individuals, it's the maximal individual constructed with the corresponding mass sum operation, $\mathbf{sup}_m$. The innovation is in a third case. If it extension consists of content-bearing atomic individuals, it's the maximal individual constructed with the corresponding content sum operation introduced above, $\mathbf{sup}_c$:

(19)   ⟦ *the* ⟧ =
$$\lambda P \begin{cases} \mathbf{sup}_i(P) & \text{if } P \text{ holds of plural individuals} \\ \mathbf{sup}_m(P) & \text{if } P \text{ holds of mass individuals} \\ \mathbf{sup}_c(P) & \text{if } P \text{ holds of atomic content-bearing individuals} \\ \iota(P) & \text{otherwise} \end{cases}$$

Thus when *the* combines with *reason* or *manner,* it picks out the individual with the largest content, the overall reason or manner. Naturally, contextual domain restrictions can constrain this in various contexts, as is the case for determiners in general.

Does this address explain the Paradoxical Cardinality Property? I think so. In describing a single event, one can individuate its reasons and manners in arbitrary ways, just as one can divide a mass of water in arbitrary ways. For a particular event, *the reason* will pick out the reason with the largest content because ⟦ *reason* ⟧ holds of atomic content-bearing individuals, $\mathbf{sup}_c(P)$. But the same event can be said to have two reasons, or four or twenty. In these cases, *the reasons* will pick out the maximal plurality of reasons, $\mathbf{sup}_i(P)$. *Way* and *manner* work in precisely the same way. The paradoxical behavior of

all these nouns arises because of the special character of content-bearing individuals.

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