Syntax and the failure of analogical generalisation: A commentary on Ambridge (2020)

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I'll confine my remarks here to the issue of whether a radical exemplar model (REM), as proposed by Ambridge (2019), can address two fundamental aspects of the syntax of (all) human languages. REM works by storing concrete representations of experiences, and then uses on-the-fly generalization via analogy to comprehend and generate new linguistic experiences. I will show first that analogy is, in general, empirically insufficient as a mechanism for generalizing from concrete memories of experienced syntactic data to new data, predicting the wrong patterns in the data itself; I will also argue that, as a matter of logic, recursivity cannot be generated through analogy but must be stored via abstract generalization. Since syntax is replete with recursivity, these arguments mean that REM is a non-starter for syntax. There is much more to say, of course, at other linguistic levels, which makes REM untenable, but I leave that task to others.

Gentner and Hollyoak (1997:33) provide a useful definition of how analogy works psychologically.

"One or more relevant analogs stored in memory must be accessed. A familiar analog must be mapped to the target analog to identify systematic correspondences between the two, thereby aligning the corresponding parts of each analog. The resulting mapping allows analogical inferences to be made about the target analog, thus creating new knowledge to fill gaps in understanding."

REM takes the analogs stored in memory to involve no abstraction, so the correspondences that allow the inferences are over surface form.

Let's imagine that some individual learning a language, call them Pat, has encountered many sentences that are similar to (1) along the observable dimension of surface form.

(1) Anson kept the picture in the shed.

Further, imagine that these sentences are encountered in situations or contexts, some of which involve pictures (or other objects) in locations being held onto by individuals, while others involve individuals maintaining the locations of pictures (or other objects). This would license the on-the-fly analogical generalization that (1) is ambiguous in a certain way, when encountered. (There may be other routes to this outcome, perhaps via exemplars with other verbs like *store*, *leave*, *deposit*, etc., but the outcome will be the same.)

Pat will also have encountered pairs of examples like (2), and let's grant that this allows them, through a similar process, to understand the syntax and semantics of questions (a concession unlikely to be reasonable, but we'll assume it for the sake of argument).

(2) Jill liked the picture. ~ Which picture did Jill like?

Such experiences will, according to REM, allow Pat, on encountering (3), to comprehend it, also via on-the-fly analogy:

(3) Which shed did Anson keep the picture in?

But on-the-fly analogy here of course predicts that Pat will comprehend (3) as ambiguous, analogously to (1): (3) is an analog of (1) plus whatever properties license the relationship between the sentences in (2), so it should have the two meanings that (1) has, appropriately altered into a question version, on analogy with (2). Unfortunately for Pat, (3) is not ambiguous. Analogy fails. (3) only has the meaning where we want to know which shed is such that Anson maintained that shed as the location of the picture. It doesn't have the meaning that we want to know which shed is such that Anson held onto the picture that was in that shed. The ambiguity, which should be expected under on-the-fly analogical generalization, vanishes.

There is another sentence that (1) is, in fact, syntactically analogous to, which is the variant with a relative clause, as in (4):

(4) Anson kept the picture that was in the shed.

But (4) shares neither surface form nor meaning with (1) (e.g. it incorporates tense information while (1) does not). Nevertheless, forming a question about the shed using a relative clause is impossible:

(5) *Which shed did Anson keep the picture that was in

So (4) is actually structurally analogous to one meaning of the ambiguous (1).

But how is poor Pat to know this without some means of abstracting away from both surface form and meaning to an abstract similarity of form? The most compelling explanation for this pattern is that one meaning of (1) involves the prepositional phrase *in the shed* being embedded inside a whole noun phrase *the picture in the shed*, which is structurally similar to the relative clause in (4). In both cases, asking a question, via English question syntax, of an element embedded inside a noun phrase leads to ungrammaticality. Irrespective of the source of the ungrammaticality (grammatical constraints, parsing, etc.), abstraction is required.

Examples of this sort are the bread and butter of syntax. They occur in every language and in every grammatical phenomenon. They show that any kind of analogy is simply untenable without abstract structure of some sort.

Now consider (6).

(6) My neighbour's cat got hurt. ~ My neighbour's cat's tail got hurt.

Children acquiring a language do not encounter more than two possessors in the prenominal position in English (Adger 2019 based on Andrews 2017). Yet adult speakers know there is no arbitrary limit to the number of prenominal possessors:

(7) My neighbour's friend's mother's cat's tail got hurt.

The syntax of prenominal possessors in English is recursive. But there is no analogical reasoning that will obligatorily extend from two possessors to multiple ones. We'd need to say that concrete experiences of multiple possessors are similar to parts of themselves to capture the recursive structure. But, looking at *My neighbour's cat's tail got hurt*, there is no subpart which is similar in surface form to the whole phrase (*cat* is a common noun, can usually be preceded by an article etc., while *My neighbour* is a noun phrase, and cannot. Note the impossibility of **My neighbour's my cat's tail*). Yet speakers do in fact generalize to multiple possessors. This is because there is an *abstract* similarity (the examples involve a noun phrase embedded inside another noun phrase---similar in abstract structure but different in surface form).

Analogy is insufficient as a means of generalization in syntax, and analogy in the absence of abstract structure even more so. It follows that a radical exemplar model of syntax is untenable.

References

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