How are Generics Defaults?

An influential research program in cognitive science holds that *generics are defaults*. In other words, the meanings of generic sentences such as "Tigers are striped" are computed via the mind's most basic mechanism of generalization (Leslie, 2007, 2008). The defaultness of generics is cited as an explanation for their ease of processing compared to quantified statements such as "All whales are mammals." Compared to quantified statements, generics are understood earlier in development (Hollander et al., 2002), processed more quickly (Meyer et al., 2011), interpreted with fewer errors (Leslie et al., 2011), and remembered more accurately (Leslie & Gelman, 2012). Here, I examine an underexplored question: *how* is this defaultness realized? What is it about generic statements that leads to the behavioral signatures just enumerated? I reject two proposals present in the literature, the *explicitness account* and the *dual-process account*. I then propose an alternative *format account*: generics are defaults because they are structurally simpler than quantified statements in respect to conceptual format.

Per the explicitness account, generics are easier than quantifiers because they involve cognitive processing performed without explicit instructions. As Leslie (2012) puts it: "If one wishes to interact efficiently with a system, and the system has a basic, default way of proceeding…then one need only issue an explicit instruction to the system if one wishes it to deviate from this default way of proceeding" (p.7). However, the fact that a system requires explicit instructions to perform certain operations does not *entail* that those operations are more difficult. For example, morphological processes frequently involve rules (e.g., add "-ed" to form past tense) that apply unless there is an *explicitly* memorized exception (e.g., "think" to "thought"). Nevertheless, morphological exceptions are generally *faster* to process than regular forms (since all exceptions are checked before the rule applies; Yang, 2016). The upshot: explicitness does not explain processing facts absent an account of implementation.

In other work, Leslie does suggest an implementation: generics are understood via fast, automatic, and effortless System 1 processes whereas explicit quantifiers are understood via slow, effortful, and rule-governed System 2 processes (Kahneman, 2003; Kahneman & Frederick, 2002; Leslie, 2007). On this *dual-process account*, when ascribing a property to category members, the generic generalizing mechanism applies automatically and must be actively inhibited to generalize using a quantifier like "all." However, the contrast between these two systems is far from clear-cut: logical rule-governed operations like *modus ponens,* the supposed domain of System 2, are routinely carried out unconsciously and effortlessly *à la* System 1 (Quilty-Dunn & Mandelbaum, 2018; Reverberi et al., 2012). Moreover, it's unclear whether the dual-process approach is a genuine explanation of the facts. We know that some cognitive processes are less resource intensive than others, labelling these processes "System 1," does not explain why this is so.

As an alternative, I argue that generics are defaults relative to quantified statements because generics employ a structurally simpler *format* at the level of conceptual representation. I assume that understanding a sentence involves constructing language specific representations

(e.g., LFs) which are in turn used to form conceptual representations (e.g., LoT sentences; Knowlton et al., 2021; Quilty-Dunn et al., 2023). Conceptual representations may differ not only with respect to their content (e.g., DOG vs CARBURETOR) but also their format. For example, we might represent the meaning of "P and Q" using either a conceptual conjunction operator (i.e., P&Q) or a NAND operator (i.e., (P↓P)↓(Q↓Q)). In general, structurally simpler formats are easier to process (Amalric et al., 2017). If a representation requires fewer steps to assemble, it should be faster to generate. Fewer steps also means less possibility for error relative to more complex representations. Finally, simpler representations require less cognitive resources and should therefore manifest earlier in development.

I propose that generics are understood by predicating properties of kinds (e.g., "Tigers are striped" is understood conceptually by predicating STRIPED of TIGERS) whereas quantifiers are understood by computing relations between sets of individuals (e.g., "All tigers are striped" is understood by computing a relation between the set of tigers and the set of striped things). All else being equal, predication is a simpler form of conceptual representation and so generics show the default processing signatures described above. However, the demands of set theoretic computation are lessened with restricted sets of concrete objects. Accordingly, quantified sentences should be easier to process in these conditions, a prediction borne out by experimental evidence (Gelman et al., 2015; Hollander et al., 2002).