The reader looks through the clause for information.

This answer will sound quite intuitive to you as a scientific reader. You read in order to find out. But how about when you read in your spare time? Is that reading also information-driven? On a news site, sure, and as well instructions or tax documents. But how about novels or greeting cards or graffiti? You read that sort of text just to enjoy yourself, right?

Well, let me make an important clarification here, because when I use the term *information*, I am using it in a functional-linguistic sense. In this sense, *information* is far less a matter of points of content and far more a matter of degrees of familiarity. To put that another way, even the most obscure and esoteric point of content will be very familiar to someone (e.g., a researcher like yourself) but at the same, very unfamiliar to most other people. Therefore, in this functional-linguistic sense, *information* is not a fixed value, nor is it a value of strictly measurable quantity, because really this term *information* describes a relation between some content and a person who knows the content to some degree, or even to no degree at all. In this linguistic sense, the *information* of some content point depends on who is looking at the content. And, in scientific prose, this looker is the reader.

So, it is the reader's relation to the content that really describes the information of every clause. This why the system of Given-New has the two terms *given* and *new*: the information labeled as *Given* is the information already familiar to the reader, while the information labeled as *New* is, to varying degrees, yet unfamiliar to the reader. I say *to varying degrees* because information in this functional-linguistic sense does permit some measurement. But more on this in a moment, because first, I want to show the form which this clausal information actually takes.

Do you remember the three functions of the clause, the Participant, the Process, and the Circumstance? If those words don't convey any special linguistic meaning to you, check out this post. It's important to know these clausal functions because they serve, too, an informational functional, namely, to segment information across a clause. Basically, the information of clauses comes in units, and those units are given already by the clauses own functions of Participant, Process, Circumstance.

So, if you've ever wondered how I seem to understand scientific prose whose research content I certainly do not understand — now you have my secret. All I do is segment clauses into Participant, Process, or Circumstance. These serve as my information units, and the three also provide me with initial clues as to the kinds of information I'm dealing with. As you have seen, Participants are nouns in the grammar and entities in the real world. Processes describe action, and verbs represent Processes. And lastly Circumstances make the conditions surrounding entities in action; for this, the grammar takes adverbs and prepositions. All that is already

a lot of information. Just the grammar on its own can tell me the number of information units and as well, a good impression of the quality of the information of each unit.

Right then, let's have a look at some information in text, and for that, I'll take again that much-parsed paragraph from *Strong and Efficient Cache Side-Channel Protection Using Hardware Transactional Memory* (2017 USENIX). Here's the parse of information units:

	Circ.1	Circ.2	Participant 1	Pro-	Circ.3	-cess	Participant 2	Circ.4	Circ.5
1			HTM			allows for	the efficient implementation of parallel algorithms		
2			it	is	commonly	used to elide	expensive software synchronization mechanisms		
3	informally	for a CPU thread executing a hardware transaction	all other threads			appear to be halted			
4		from the outside	a transaction			appears as	an atomic operation		
5			a transaction			fails		if the CPU cannot provide this atomicity	due to resource limitations or conflicting concurrent memory accesses

6			all transactional changes			need to be rolled back			
7		To be able to detect conflicts and revert transactions	the CPU			needs to keep track of	transactional memory accesses		
8			transactional memory	is	typically	divided into	a read set and a write set		
9			A transaction's read set			contains	all read memory locations		
10			Concurrent read accesses by other threads to the read set	are	generally	allowed			
11			concurrent writes			are	problematic		
11'	depending on the actual HTM implementation and circumstances	likely	[concurrent writes]			lead to	transactional aborts		
12			any concurrent accesses to the write set		necessarily	lead to	a transactional abort		
*	You'll have noticed that certain words have been cut in this parse: *whereas* (No.4), *in this case* (No.6), *therefore* (No.8), *however* (No.11), *and* (No.11'), *further* (No.12). Those are words that fall outside the system Given-New for these clauses. Given-New is not exhaustive, as is the system Theme-Rheme. This is because Theme-Rheme is a system operating at the constituent-level of the clause, whereas Given-New is a system operating above that level. What exactly does that mean? Well, essentially it means that Theme-Rheme must end at the end of each clause, but Given-New may span multiple clauses or even narrow down inside of just one portion of a clause. To explain this properly, though, I would need to get into the phonological basis of the system Given-New, and to be honest, you just don't need to know that in order to read and write good research copy. Therefore, if you catch me at lunch some day, or better yet, over a cup of tea, I'll tell you about intonation. Till that time, just note that Given-New omits little conjunctive words at the beginnings of clauses.									

Look at that middle column *Process*, the one divided in half (more on why in the next post). In every clause, one unit of information is a Process, and very often just one unit. The reason is that the verb is the defining feature of the clause, so the normal relation is, as you know from Part 2, one verb is one clause. Therefore, the information of Process will normally make only one unit per clause. But Process information is pivotal information — it's what is doing or being in the clause.

And the one doing or being, *that* is a Participant. Every clause will have at least one Participant, the one in front of the verb. Many clauses will have a second Participant behind the verb as well. For example, of the full thirteen clauses above, nine have a Participant also behind the verb. That's a typical distribution of second Participants in a stretch of text.

So, your takeaway here is this: the information of what does or is you'll find in the Process, while the information of who or what does the Process, that information you'll find in Participants. And know, Participants normally are taken up by the grammar as nouns, while Processes really only can be realized by the grammatical form of the verb.