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## Typology and Complexity<sup>1</sup>

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### 1. Complexity in What Sort of System?

For the Workshop I was asked to talk about complexity in language from a typological perspective. My way of approaching this topic was to ask myself some questions, and then see where the answers led. The first one was of course, “What sort of system are we looking at complexity in — what kind of system is language?”

There are at least three different kinds of system that we can talk about, and each kind of system is related to a different kind of phenomena. The first kind are natural phenomena, like weather systems and living organisms. In these systems you often find evolution towards greater complexity — of course you can have simplification, but in general you have, at least in the history of evolution, like the evolution of man, greater and greater complexity.

Phenomena of the second kind are the intentionally man-made phenomena, such as the internal combustion engine, and here development can go either way — you can have development toward more complex things like the piston engine itself (earlier

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<sup>1</sup> This paper is an edited transcript of the talk I gave at the Workshop. I would like to thank James Minett for his excellent transcription of my talk.

Figure 1a  
School and bus stop  
separated by a field

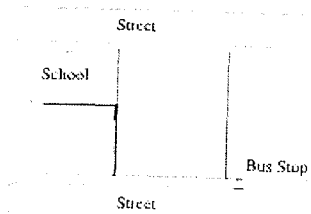


Figure 1b  
Students begin crossing the field  
to get to the bus stop

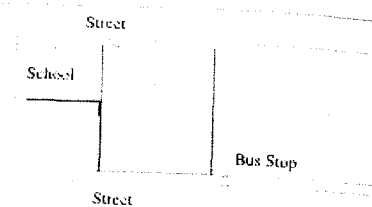


Figure 1c  
The grass begins to wear away  
and a path emerges

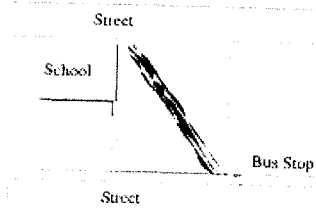
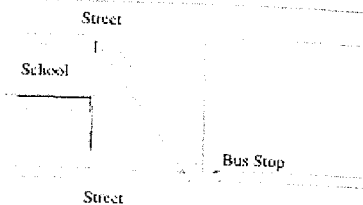


Figure 1d  
The path is recognized  
and paved



types of engines were somewhat simpler) but then we also have simplifications, like the intentionally simplified rotary engine — one of the pluses of the rotary engine is that it has less parts, and is an overall simpler system.

Phenomena of the third kind are man-made, but not created with the intention of creating the thing that is produced. Humans act according to goals but the goals in the case of phenomena of the third kind are not like those in the case of phenomena of the second kind, that is, to create that particular structure or that particular system. It is a more local and personal goal, and the combined activity of all the people attempting to achieve their goals creates that particular phenomenon, like an economy or a path in a field. Phenomena of the third kind are often called ‘invisible hand’

phenomena, as it is as if an invisible hand creates the phenomenon. An example is the creation of a path through a field (cf. Mauthner, 1912; Keller, 1994). Let’s say we have two streets separated by a field; there’s a school on one street at one end of the field and a bus stop on the other street on the other side of the field (Figure 1a). When the kids come out of the school they want to go to the bus stop. Their goal is to get to the bus stop, so they try to pick an easy way to get there — they cross the field (Figure 1b). Maybe at first one or two of them cross the field, and some other students see them doing it, and see that the ones who go through the field get to the bus stop faster and easier by going that way through the field, and so they too start doing it; they copy the first students. Then more and more students cross the field in the same way. Over time, the students trying to get to the bus stop start to wear away the grass, so a very rough path develops (Figure 1c). It’s not that somebody said “Let’s form a path.” It’s just that a lot of people tried to find the most efficient way to get to the bus stop from the school, and they ended up walking the same way through the field, trampled the same grass, killed the grass, and created a path. Eventually people start using the path just because it is there, without thinking about whether it is the best way to go through the field. At some point, either out of simple conventionalization or because of some social factor (e.g. attitudes towards preserving the grass that is left), it may become recognized as the “unmarked” way to go through the field and crossing any other way would be considered “marked”. What happens in society often is that a development like this can be recognized and then made official — you pave the path (Figure 1d) — and then it becomes prescriptive.

The path thus created is a phenomenon of the third kind. Language is also a phenomenon of the third kind. It is not a natural phenomenon, it does not follow the same kind of natural laws; it is based on humans trying to do something, but not trying to create language. Its development is a type of evolution, but it can go toward greater or lesser complexity. Just as with the path, there can also be intentional manipulation of language, such as when we write prescriptive grammars, or standardize languages. There can be

planned economies and planned languages, like when Malay pidgin was made into Bahasa Indonesia, the national language of Indonesia. In this case, they chose Malay Pidgin rather than Javanese to be the national language because Javanese is more complex than Malay Pidgin. Javanese has multiple levels of politeness registers — five levels of politeness — and this makes it difficult to learn and use, so they chose Malay Pidgin, as they wanted a language that would be easier for everybody to learn and use.

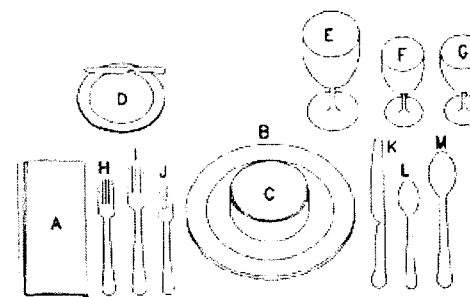
## 2. Complexity in Different Subsets of Human Conventions

One of the things I want to talk about is complexity in different subsets of human conventions. Language is just one of many types of convention; it's a tool that has developed, one of many tools that we have developed. Humans do things and, in the process of trying to do something, create systems and tools. One of the many types of tools that we have developed is the type of tools we use for eating. We can have a system of great complexity or a simple system in terms of the way we eat. Take for example the Western formal place setting presented in Figure 2a, which is from a web page<sup>2</sup> that was set up to tell people how to set a formal place setting at home. In a formal banquet in a restaurant there might be even more forks, or more knives and spoons. Here we've got a salad fork, a dinner fork, a soup spoon, a tea spoon, different glasses for different kinds of wine, one glass for water, a serving plate, a bread plate, a soup bowl, a bread knife, another knife, and if steak was being served, a steak knife would also be added. This is a relatively complex system for eating. However, you can also have a relatively simple system for eating, as in Figure 2b, which is only a bowl and a pair of chopsticks. In fact in many of the places where I go to do fieldwork in rural

<sup>2</sup> <http://www.visatablelinen.com/formal.html>, Milliken Table Lines & Table Cloths:Table Setting:Formal Dinner Place Settings.

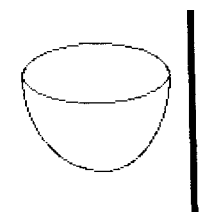
China you don't even get the bowl, all you get is the chopsticks. In many places in the Philippines and Burma you just use your hands — that's even simpler, but, of course, that's not a developed tool. The minimal tool is the chopsticks.

Figure 2a. Western formal dinner place setting



- |  |                 |
|--|-----------------|
| A. Napkin                                    | H. Salad Fork   |
| B. Service plate                             | I. Dinner Fork  |
| C. Soup bowl on a liner plate                | J. Dessert Fork |
| D. Bread and Butter Plate with butter knife. | K. Knife        |
| E. Water glass                               | L. Teaspoon     |
| F. Wine glass                                | M. Soup Spoon   |
| G. Wine glass                                |                 |

Figure 2b. Chinese informal place setting



So you can have complexity or the lack of it in different systems within your overall set of conventions. What happens in one system may influence what happens in other systems. For example, cutting up the food before it's served, as the Chinese do, means it is not necessary to have a knife at the table. In a Western setting we have to have a steak knife when eating steak because the cook has not cut the steak up into bite-size pieces before serving it. In a Chinese setting, the cook has already cut the food up. So the conventions of cooking influence the conventions of eating. There are a lot of other types of conventions that influence each other. For example, the Jingpo people of Yunnan don't fertilize their crops, and so they don't save human manure like a lot of other peoples do to use as fertilizer for their crops. And since they don't save human manure they don't even build bathrooms, they just go to the woods. Because of this, they don't have a native word for 'bathroom'. Their conventions of agriculture influence their conventions of architecture, which in turn influence their conventions of language. There is influence in terms of complexity, as complexity in one system can mean simplification in another, for example complexity in the conventions of food preparation may result in simplicity in the tools that you need to eat with.

Now let's look at a linguistic example. The speakers of the Qiang language (Tibeto-Burman; northern Sichuan) conventionalized the set of orientation marking prefixes on the verb given in (1).

(1) Qiang directional prefixes (*ɬue* 'throw')

|             |                                |             |                                  |
|-------------|--------------------------------|-------------|----------------------------------|
| <i>təɬu</i> | 'throw up<br>(the mountain)'   | <i>zəɬu</i> | 'throw towards the<br>speaker'   |
| <i>ɦaɬu</i> | 'throw down (the<br>mountain)' | <i>daɬu</i> | 'throw away from the<br>speaker' |
| <i>səɬu</i> | 'throw down-river'             | <i>əɬu</i>  | 'throw inside'                   |
| <i>nəɬu</i> | 'throw up-river'               | <i>ɦaɬu</i> | 'throw outside'                  |

These prefixes (the first syllable of the forms given) are a system for marking the direction or orientation of the action, such as 'throw up the mountain', 'throw down the mountain', 'throw down river', 'throw up river'. This system has also been extended to marking perfectives, as in (2) and (3), and imperatives, as in (4).

- (2) *the sə-tɕ-nike, kuatɕə ɣuəla-k*  
3sg DIR-eat-following bowl wash-go  
'S/he finished eating and went to wash the bowl.'
- (3) *nəs qa ə-qa lai the: stuaha tɕhə*  
yesterday 1sg DIR-go:1sg time 3sg food/rice eat  
'Yesterday when I entered the room, s/he was eating.'
- (4) *ə-z-na!*  
DIR-eat-IMP  
'Eat!'

In (2) and (3), the verb in the first clause has the direction prefix because the action was completed, while the verb in the second clause of each example does not have a prefix, as the action is not completed (and the direction of action is not important here). In (4) the directional prefix appears on the verb because it is an imperative clause (see LaPolla, 2003, for details). The point I'm making here is that even within language, once you have conventionalized a system, you can extend its use to marking some other functional domain. In Qiang a kind of marking which originally developed as a system of orientation or direction marking is now used for marking perfectives and imperatives. The complexity in this system now allows for simplicity in other types of marking — you don't have to develop a separate set of perfective or imperative markers, you just use the same forms that already exist in the language for some other purpose. It can be said that having something in the language that could easily be metaphorically extended to another use encourages the development of the marking also, so it might not just be that it allows for the simplicity of the other system but that it actually encourages the development of that particular use, because you have something that could easily be extended that way.

### 3. Complex for Whom?

An important question that came up when I was thinking about this topic was, “Complex for whom?” In China, cutting up the food into small pieces makes the job of the cook more complex; the cook has to worry about how he or she is going to cut the food. In fact, in Chinese cooking, one test of a cook is how he or she cuts; in Western cooking, I don’t think they worry so much about cutting, but in Chinese cooking it is very important how you cut things because you have to cut up all the food before you serve it. This makes the job of the cook in China much more complex but it makes the job of the diner much simpler — again, you have the complexity of the cooking job making the eating much easier. It is the same with language; a simple system of writing or language is less complicated for the writer or the speaker. For example, if you have a writing system that doesn’t have strong conventions about punctuation or a particular set word order, and has a set of other features that are relatively open to speaker or writer choice, this simplicity makes it easier for the writer, who doesn’t need to worry about having to follow some set of prescriptive forms, but it allows ambiguity, which makes it more complicated for the reader. Consider the following attested examples of Chinese writing.

In Chinese, an author can choose various orders in which to write. In (5a) the writer wrote from left to right; in (5b) the author wrote from right to left. When you see these restaurant signs, as both are three characters long, and there is nothing in the writing system which tells you which way to read them, you have to use inference to figure out yourself which order is correct. So the job of the reader is more complicated because there is no standard direction of reading. It can be even more complicated, as in the case of (5c), which is a sign in Taipei, where you have to read from left and right at the same time, a short version of two two-character names (the three characters are, from left to right, “lao bao gong”, representing “lao bao” and “gong bao”, two types of medical plans in Taiwan) — to save space on the sign they just use three characters; instead of writing “lao bao” and “gong bao”, since one of the

(5)

- |  |  |  |
|--|--|--|
| a. Left to right:                        | →<br>功德林   | (restaurant sign in HK)                |
| b. Right to left:                        | ←<br>苑河金   | (restaurant sign in HK)                |
| c. Right to left and<br>Left to right:   | → ←<br>勞保公   | (clinic sign in Taipei)                |
| d. Top to bottom /<br>Right to left:     | ← ↓<br>文 中<br>學 國<br>探 現<br>研 當<br>代                             | (book cover)                           |
| e. Top to bottom /<br>Left to right      | ↓ →<br>奮 音<br>戰 配<br>一 像<br>百 的<br>天 全<br>奪 面<br>取 勝<br>京 利<br>劇 | ( <i>Guangming Daily</i><br>2002/4/21) |
| f. Top to bottom /<br>?? Does it matter? | 上 不 大<br>車 設 小<br>入 找 同<br>錢 贖 價                                 | (sign in Hong Kong<br>minibus)         |

characters is the same in both, they just have you read it from both sides in at the same time. In Chinese it is also possible to write from top to bottom vertically, as in (5d, e). When you write vertically, you can write either from right to left, as in (5d), the title of a book, or left to right, as in (5e), a headline from a mainland Chinese newspaper. There is nothing in the script and no hard and fast

conventions, except for the convention that when it is written vertically it should be top to bottom,<sup>3</sup> that tell you which way you are going to have to read it; you have to figure that out by trying different possibilities and then deciding which makes more sense. The simplicity of the conventions related to word order makes it easier for the writer, because the writer doesn't have to follow many strict conventions, as in English. However, it makes the job of the reader more complex because the reader has to use a much more complicated inferential process to figure out which way makes sense. The process is not simplified for the reader. And sometimes, of course, you get to a situation like in (5f), which is a sign in the mini-buses in Hong Kong, where one may not be sure which way to read it. For the first six years that I have lived in Hong Kong I have always read this top to bottom and right to left, but when I was preparing the talk for the workshop I began to think maybe it should be read top to bottom and left to right, because it makes sense either way. But it's just a matter of which one you think makes more sense, because the three lines are three independent sentences. You notice of course that there is no real separation of anything within the clauses as well, so there is a lot of inference going on when you are reading this. On the other hand, if you have a standardized word order and punctuation, the job of the writer is more complex, because the writer has to worry about using the right word order and punctuation, but it simplifies the task for the reader because it's constraining the reader's inferential process.

Now, there can be differences in terms of complexity between any two systems, and within a single system there are also different possibilities for complexity, so we might have a difference in complexity of the overall system, such as the difference in the

<sup>3</sup> These patterns of writing go all the way back to the oldest form of Chinese writing, oracle bone inscriptions, texts written on ox scapulas and turtle plastrons that had been burned and cracked in divination rituals, where the writing relating to a particular divination had to be near the relevant divination crack, and the direction of the cracks influenced the direction of the inscription (see Keightley, 1978, §2.9.4 for details).

systems of eating Chinese and Western food, but even within a single system, like the system of English language use, the speaker has choices in terms of how complex to make an utterance. Consider the following example:

- (6) Q: *Do you want something to drink?*  
 A1: (points to soup bowl)  
 A2: *I have soup.*  
 A3: *No. I have soup.*  
 A4: *No, because I have soup.*  
 A5: *No, since I have soup, I don't need anything to drink.*  
 A6: *No, I don't want anything to drink. Since I have soup, I don't need anything else to drink right now.*

This was a conversation I had with my wife while eating dinner. I asked her *Do you want something to drink?* — her answer was to point to her soup bowl; that was her answer and I had to figure out what that meant. Simply pointing like that means I have to figure out what she is pointing at, and if I guess it is the bowl that she is pointing at, then I have to notice that the bowl is full, and then I have to notice what kind of thing is in the bowl, then I have to somehow think that's relevant, and then guess how it is relevant, and then I have to figure out that if it's a full bowl of soup (broth), then think back that I'm asking her if she wants something to drink, and since soup is a liquid, maybe what she's thinking is that since she has a bowl full of liquid she doesn't need anything else to drink. So with pointing as her answer I have to do all of this very complicated inference. But if she says *I have soup*, at least the first part of my inferential process is constrained — figuring out what she is pointing at and what's in the bowl, that part is made simpler. If she says *No, I have soup*, then my inferential process is constrained even more; it is made even more simple by the fact that she has added the word *no*, but I still have to infer the relationship between the word *no* and the concept "I have soup". She could also constrain that part by putting in the word *because*. She could say *No, because I have soup*, and then my inference of the relationship between *no* and *I have soup* would also be constrained. The answers

in (6A5) and (6A6) would also be possible, and again, the more complex the utterance that she uses, the more simple my inference in determining her communicative intention. It is like the example of writing systems given above: the more complex it is for one of the two communicators, the more simple it is for the other and vice versa.

#### 4. Background: Ostension and Inference

Now I have to back up a little bit and talk about what human communication is all about. Human communication isn't about language, and language is not what is most important to human communication; as I mentioned, language is just a tool. What happens in communication is somebody does something, what we call an ostensive act, that gets the other person's attention and the other person then, having seen the purposefully done act, assumes that the other person did that act for a reason, and then tries to figure out what that reason was; that's communication. Language is not crucial to communication. We communicate all the time without language, just like my wife pointing to her soup bowl. Another example is from one morning shortly before the Workshop. I wanted to communicate something to my wife, but there was a guest sleeping in the room, so I couldn't say anything. Therefore I just pointed upward with my index finger. What I was trying to communicate was that I was going to go up to the roof to do my exercises, and she understood that. So language is not absolutely necessary for communication, communication can happen whether you use language or not. The thing that language does in communication is constrain the addressee's inferential process. The ostensive act, which may be linguistic or not, draws the other person's attention and makes them think that the act is done purposefully and that they should apply some inferential process to figure out what the communicator's intention was in doing this. As we assume that people are rational (that's the basis of Grice's (1975) Co-operative Principle), when they do an ostensive act we assume they must be doing it for a reason and we should figure out what

that reason is. The way we figure it out is we create a context in which that ostensive act makes sense. Just like the example of pointing at the soup bowl, we have to figure out how pointing at the soup bowl could make sense in the context of expecting an answer to my question. I have to work through all the possible assumptions that I can put together and create a context of interpretation in which that particular ostensive act makes sense as an answer to my question. The thing that language can do is constrain the creation of this context of interpretation. In discussing the example of the soup bowl, I gave alternative responses with more complex forms, and showed how the more complex the linguistic form, the more constrained I would be in creating the context of interpretation and in figuring out what my wife's communicative intention was, her intention to tell me that she didn't want anything to drink.

I want to point out something in my view of language that is different from a lot of other people's view of language. In most work on language and communication, even in pragmatics, the form of the utterance is taken as given and it is assumed that the context is variable, and that we use the context to disambiguate the form. I see it the other way around. The way I see it, when we are in a communicative situation, we don't have a lot of choice about the context, we are in that context. What we can choose is what particular ostensive act, what particular utterance, we are going to use in that context, so that's the thing that is variable and that is the thing that's constraining the creation of the context of interpretation. Language and the rules for its use in a particular society are a set of social conventions that have evolved in a particular way in that society in a response to the need to constrain the inferential process involved in communication in particular ways thought to be important in that society. Let me come back to this.

#### 5. Is Complexity Necessary?

Let me first ask, "Is complexity necessary?" In some cases, like what we saw in the soup bowl example, in talking with me, my wife didn't need to be any more complex than pointing at the soup bowl,



I could figure the rest out. If she was in a restaurant and the waiter asked her, “Do you want something to drink?” I don’t think she could get away with just pointing at her soup bowl. So whether or not you need a certain level of complexity will depend on where you are, and on the complexity of other systems. We use forms to fit the context, and if we are in a particular context often, and use particular forms in particular ways to fit that context, they can become conventionalized. Like the Qiang directionals mentioned earlier. I don’t think it is a coincidence that the Qiangs live on the sides of steep mountains overlooking river valleys, so they always have to be going up and down, towards the river and away from the river. Those are important aspects of their environment, and this fact has led to forms for constraining the hearer’s interpretation in ways relevant to these aspects becoming conventionalized in their language. The nature of a society, such as the size and complexity of the speech community, can influence the patterns of the language spoken, and this will in turn influence the form that the language takes. There has been a lot of work on this. In particular, Trudgill (1996, 1997) pointed out that in a small community you are more likely to have more complex phonological systems, whereas in a widespread homogeneous community you are going to have simpler phonological systems. So there are all kinds of factors that can influence the level of complexity of a system.

Now another thing about complexity, as we saw with the soup bowl example, is that more complex generally means more specific or more exacting. So if I want to have two pieces of bread instead of one, I can rip it into two with my hands — that’s the simplest way to deal with the problem — or I can use a tool. It’s more complex to use a tool, but if I use a tool I get a more exact cut. This is the same with language; the use of more explicit language constrains the hearer’s interpretive process much more, and so the hearer’s interpretation is more likely to be exactly the one intended by the speaker. For example, consider the two sentences in (6):

- (6) (a) *Peter’s not stupid.* (b) *He can find his own way home*

- (7) a. *Peter’s not stupid; so he can find his own way home.*  
 b. *Peter’s not stupid; after all, he can find his own way home.*  
 (from Wilson and Sperber, 1993:11)

If one were to say “Peter’s not stupid. He can find his own way home,” without anything marking the logical relationship between the two sentences, it would be up to the hearer to figure out what the relationship is. There are two logical possibilities at least. It isn’t obligatory to make explicit what the relationship is. But you could make it explicit; you could say *Peter’s not stupid so he can find his own way home*, as in (7a), or *Peter’s not stupid; after all, he can find his own way home*, as in (7b). The relationship between the two clauses can be made explicit by the use of *so* or *after all*, and this is parallel to using a knife to cut bread; it makes the action more exacting, more fine in the case of cutting, and more explicit in the case of linguistic actions, and in doing that, by constraining, in the linguistic example, the inferential process, the speaker reduces the chances that the hearer will not be able to construct a context of interpretation in which the utterance makes sense. That is, it increases the likelihood that the hearer will correctly deduce the communicative intention of the speaker, just as you are more likely to get a nice neat cut of two even pieces of bread if you separate them with a knife rather than by hand.

Now, why might a language develop an obligatorily explicit form? For a pattern of explicitness to be used often enough by enough people for it to become conventionalized, it must be constraining the interpretation of some salient category. That is, it has a cultural motivation. In some cases it isn’t easy to find the cultural assumptions that lead to the conventionalization of a certain form of explicitness, but sometimes it is. For example, when a speaker of Kalam (Pawley, 1993; Pawley and Lane, 1998), a language of Papua New Guinea, is reporting an event, he or she is expected to make reference to the whole sequence of situations and actions associated with the overall event, such as whether the actor was at the scene of the event or moved to the scene; what the actor

did; whether the actor then left the scene, and if so whether the actor took the affected object along or not; and what the final outcome of the event was — all of these are culturally required when you are describing some event. In English, you could just say *The man fetched firewood*, but in Kalam, you can't just say 'fetched firewood'; you have to say the whole series of events that happened in his going, his coming back, what happened in between, and so the narrative will be very complex, and this complexity is required by the culture. The interpretation of these aspects of the event are then generally more constrained in Kalam than in English. The narration of these sub-actions can take the form of many complex clauses, or, in the case of relatively commonly recurring multi-action events, can take the form of a conventionalized serial verb construction, as in (8) (from Pawley, 1993:95). In (9) is a conventional expression for 'to massage' in Kalam (Pawley, 1993:88).

(8) *b ak am mon p-wk d ap ay-a-k*  
 man that go wood hit-bread get come put-3sg-PAST  
 'The man fetched some firewood.'

(9) *pk wyk d ap tan d ap yap g-*  
 strike rub hold come ascend hold come descend do  
 'to massage'

It is because of the requirement on the explicitness of narration that the language has developed the sets of serial verb constructions that code frequently occurring sets of action sequences. That is, because certain actions often were narrated in the same way, and repeated over and over again, what formerly took the form of several clauses became simplified to a serial verb construction.

Now, whether or not we can find a smoking gun — in this case there's a very clear smoking gun, they have a societal expectation that a speaker should narrate all these sub-actions of an event, and we can use that to explain the development of the serial verb constructions — the fact that the pattern of explicitness is repeated often enough to become conventionalized means that it has to be

culturally important. Some people argue that if you can't find the motivation for some particular form, you can't say it's motivated. My point of view is that grammar, or any linguistic structure, develops out of patterns that have been repeatedly used over and over again so often that they became conventionalized, and the fact that they became conventionalized means that they had to have been repeated a lot, and the fact that they were repeated a lot means that they had to have been constraining some important aspect of the interpretation; a speaker is not going to repeat something often if it is not important to him or her to constrain the inference in that particular way.

## 6. We Seem to be Able to Do Well Without Some Forms of Complexity

Getting back to this question of whether complexity is necessary, sometimes it seems we can do without it. For example, in Old English there was a very complex system of declension of nouns and adjectives, but we do quite well without it now. Old English inflected nouns and adjectives for four different cases in singular and plural, and an adjective had three different forms for the three different genders (actually six, as there were different forms depending on whether the noun took a demonstrative or not). In (10) are examples of the nouns *stān* 'stone' (masculine *a*-stem), *giefū* 'gift' (feminine *ō*-stem), and *hunter* 'hunter' (masculine consonant stem):

|               |            |                |                |                 |
|---------------|------------|----------------|----------------|-----------------|
| (10) Singular | Nominative | <i>stān</i>    | <i>gief-u</i>  | <i>hunt-a</i>   |
|               | Genitive   | <i>stān-es</i> | <i>gief-e</i>  | <i>hunt-an</i>  |
|               | Dative     | <i>stān-e</i>  | <i>gief-e</i>  | <i>hunt-an</i>  |
|               | Accusative | <i>stān</i>    | <i>gief-e</i>  | <i>hunt-an</i>  |
| Plural        | Nominative | <i>stān-as</i> | <i>gief-a</i>  | <i>hunt-an</i>  |
|               | Genitive   | <i>stān-a</i>  | <i>gief-a</i>  | <i>hunt-ena</i> |
|               | Dative     | <i>stān-um</i> | <i>gief-um</i> | <i>hunt-um</i>  |
|               | Accusative | <i>stān-as</i> | <i>gief-a</i>  | <i>hunt-an</i>  |

In (11) is the declension of *gōd* 'good' when preceded by a demonstrative (gender is neutralized in the plural when the form is preceded by a demonstrative, but not when not preceded by a demonstrative):

|      |            |                                  |               |               |
|------|------------|----------------------------------|---------------|---------------|
| (11) |            | Masculine                        | Feminine      | Neuter        |
|      | Singular   |                                  |               |               |
|      | Nominative | <i>gōd-a</i>                     | <i>gōd-e</i>  | <i>gōd-e</i>  |
|      | Genitive   | <i>gōd-an</i>                    | <i>gōd-an</i> | <i>gōd-an</i> |
|      | Dative     | <i>gōd-an</i>                    | <i>gōd-an</i> | <i>gōd-an</i> |
|      | Accusative | <i>gōd-an</i>                    | <i>gōd-an</i> | <i>gōd-e</i>  |
|      | Plural     |                                  |               |               |
|      | Nominative | <i>gōd-an</i>                    |               |               |
|      | Genitive   | <i>gōd-ena</i> or <i>agōd-ra</i> |               |               |
|      | Dative     | <i>gōd-um</i>                    |               |               |
|      | Accusative | <i>gōd-an</i>                    |               |               |

Modern forms:

|                          |               |              |                |             |
|--------------------------|---------------|--------------|----------------|-------------|
| Singular (for all cases) | <i>stone</i>  | <i>gift</i>  | <i>hunter</i>  | <i>good</i> |
| Plural (for all cases)   | <i>stones</i> | <i>gifts</i> | <i>hunters</i> | <i>good</i> |

Speakers of the system of Old English had to choose one of the forms from these paradigms every time they wanted to mention a stone, a gift, a hunter, or say something was good, and these paradigms are quite complicated, whereas in the modern system the paradigm is much simpler, just *stone/stones*, *gift/gifts*, *hunter/hunters*, and only one form for the adjective. We do okay with this simple system; we don't need a great deal of complexity. A language doesn't have to develop towards more complexity. In the case of English, it developed away from that particular type of complexity.

## 7. Complexity as a Feature of Categories, Not Language

One of the things that I want to mention, when talking about linguistic complexity, is that it is not that we want to talk about a language as a whole as being complex or not complex; we need to think in terms of sub-systems or categories of the language. For example, Chinese has a simpler system in terms of not having conventionalized tense marking, so a speaker doesn't have to worry about tense when speaking, one can just say, for example, *Wǒ qù xuéxiào* 'I go school' and not say whether it was in the past, in the future or whatever, so in terms at least of the speaker it's an easier job. But Chinese has developed a complex system of lexical categories coded in taxonomic compounds such as *lóng-xiā* 'lobster' (*dragon-shrimp*), *jīng-yǔ* 'whale' (*whale-fish*), and *sōng-shù* 'pine' (*pine-tree*), where the second syllable identifies the taxonomic class that the referent belongs to. It also has a complex system of classification of nouns using what we call noun classifiers, so you don't just say 'one book', like in English, where you don't have to worry about what class of object you're talking about when you want to quantify an object. In Chinese you have to worry about what category you are talking about, and add the classifier for that category when you quantify that object. Compare, for example, English *one book* vs. Chinese *yī běn shū* (*one classifier.for.book-like.objects book*), English *one table* vs. Chinese *yī zhāng zhuōzi* (*one classifier.for.flat.rectangular.objects table*). It's more complex when you have to know what category each word is in in order to quantify it. The point is that Chinese has developed complex systems for constraining the interpretation of some functional domains, but not others, and so we can't make blanket statements about languages, we need to look at each functional domain to see how the language deals with it.

Different sub-systems of a language can also interact. To give one example, Proto-Arawak, an Amazonian language, had several locative cases but no marking of grammatical relations. Later,

mainly through contact with other, unrelated, languages in the same area, Tariana, an Arawak language, developed a complex system for marking grammatical relations by restructuring the locative cases (Aikhenvald, 2003). Tariana originally had a complex locative system and a simple, or no, system of grammatical relations, but then it restructured the locative cases into a complex system for marking grammatical relations and certain other features, and at the same time simplified the locative markings so that it now has only one very general locative case marker as opposed to having several before. Sometimes this can go back and forth — this is why we need to think about complexity in terms of the particular categories, not in terms of whole languages.

## 8. Complexity of Language as a Reflection of Complexity of Cognitive Categories

The complexity of language is a reflection of the complexity of cognitive categories. The clearest example of course is phonemes; phonemes are categories. When we are babies, we can distinguish all kinds of sounds, but then later on we get into the habit of thinking that certain sounds go together in one category and other sounds get divided between two categories. For example, English speakers perceptually group together the voiced stop initials and voiceless unaspirated initials as one category, so they don't hear the difference between [ba] and [pa]. Because of this, when a Chinese speaker says [peitɕiŋ] 'Beijing', with a voiceless unaspirated initial, an English speaker will hear it as if it is the same sound as the voiced initial [b], and will often pronounce the Chinese word as [beitɕiŋ], as they can't hear the difference between the two sounds. Once you've made these categories, once you are habituated to these categories, the categories affect your perception. There's a specialist in neuroscience at UCSD named Vilayanur Ramachandran. He summarizes his findings on perception by saying, "Perception is an opinion", because when we hear, we don't hear the different sounds, what we

hear is filtered through the different categories in the mind. This is true of vision as well. The complexity of the language, whether a language separates certain sounds or not, is a reflection of the complexity of the categories in our minds. Shanghainese distinguishes voiced stops, voiceless unaspirated stops and voiceless aspirated stops, so for speakers of Shanghainese these are three different cognitive categories. So they have a more complex set of categories, at least in terms of stop consonants, than most English speakers, who have only two different categories for the three sounds.

Another example is the difference between English and Mandarin Chinese speakers in terms of the conception of possession. In English there is no obligatory distinction between ownership and temporary physical possession; the verb *have* is used for both. But in Mandarin, these two categories are distinguished. For example, if I pick up this disk, this is my floppy disk, in English I can say *This is my disk*, and if my disk is in the hands of someone else, I can say to that person, *You have my disk*. In Mandarin you can't do that; you can't say the equivalent of 'You have my disk', you have to say something like 'My disk is at your place', with a locative expression rather than a possessive expression (this is not true of Cantonese, possibly due to English influence). The point is that Mandarin makes a distinction between ownership and temporary possession. I have found that after many years of speaking Mandarin, this way of thinking has affected my English, so in situations where someone had something of mine, I have found myself saying things like *My disk is with you*, rather than *You have my disk*. So my cognitive categories are being influenced by the language that I was speaking all the time, in this case a second language. But on the other hand, my English category distinctions (and lack of them) also affect my Mandarin. For example, I often don't make a distinction between second person singular and second person plural, because I'm a native English speaker; we just have *you* for both singular and plural. I find myself, when speaking Mandarin, using just *nǐ* (2sg pronoun) when I should use *nǐmen* (2pl pronoun) for the plural; I just forget about the plural because I am so used to thinking with just one

category, not two categories. When we learn a language that doesn't make the same distinctions that we are used to making, distinctions that reflect the distinctions made in our cognitive categories, we will try to fill in the perceived gaps. For example, in English we have obligatory tense marking, but Mandarin doesn't have tense marking, and so a lot of English speakers, when they learn Mandarin, will look for something that seems like tense marking, they'll find the perfective marker *le* and then use it any time that they feel would require a past tense marker in English. Or they will over-specify. For example, in English, if you want to say something like *I'm going to go wash my hair*, you have to include a possessive pronoun to specify whose hair is going to be washed. In Mandarin you don't have to add a possessive pronoun; you just say *Wǒ qù xǐ tóufǎ* (lit.: I go wash hair), and in most contexts it's assumed that you know whose hair you are going to wash; you don't have to be specific about that. Native English speakers will often add the possessive pronoun to such a clause when speaking Chinese, though, as they feel the need to constrain the interpretation of whose hair is being washed because they are used to doing so when speaking English. On the other hand, a Chinese speaker living in America for thirty years will often still make mistakes in the use of *he* vs. *she* when speaking English — its just not a categorical difference that they have internalized, as their native language does not make that distinction.<sup>4</sup>

## 9. The Development of Language Structure

Now back to the development of language structure. Grammar develops as the originally free collocations of lexical items used to

<sup>4</sup> The third person pronoun in spoken Chinese does not inflect for animacy or gender, but in the early 20th century many Chinese intellectuals learned English, French, or German, and came to feel the need to constrain, at least in writing, the interpretation of the referent of the third person pronoun, and so developed different ways of writing the third person pronoun in Chinese for male, female, inanimate, and godly referents.

constrain the hearer's inference in a particular way become fixed in those particular structures. In communicating you want to constrain the hearer's inferential process; in the beginning you can use any words to do that, any words are still better than no words. But then if you find that the particular pattern works, very often you repeat it again and again to constrain the hearer's inference in that particular way, and then the pattern can become fixed. First it's personal habit, and we are very much creatures of habit; all of our language use is really habit. And on a societal level, conventions are really just societal habits. For example, in Old English the word *lic* 'like' plus the instrumental suffix *-e* were used so often after an adjective to make explicit an adverbial relation to a verb that it became conventionalized and developed into the adverb-forming suffix *-ly*, as in *quickly*, used obligatorily in many contexts in English today (Lass, 1992). The frequent use of a demonstrative adjective to show that a referent was cognitively accessible conventionalized into definite marking in English (Pyles and Algeo, 1982). You can see this happening in Chinese; the demonstrative adjective in Chinese is being used so often as a way of showing indentifiability that some people are arguing that this is now becoming a definite marker, just like in English. Or in Chinese, you had a locative phrase that was used very often with an implication that the action was on-going, so you would say things like *Tā zài nàr chī fàn* (3sg LOC there eat rice) "He is eating there". Eventually, you could drop the "there", and just say *Tā zài chī fàn* (3sg PROG eat rice), as the locative verb *zài* was reanalyzed as a progressive marker (Chao, 1968:333). So what begins as a conversational implicature over time becomes conventionalized, and then becomes conventional implicature, and can then become further conventionalized until it becomes part of the grammar that forces a particular interpretation. Now what's important is that grammatical structure that has become obligatory forces a particular interpretation. Some people say that languages differ in terms of what you *can* say, but another way to look at it is that languages differ in terms of what you *have* to say: English forces you to be much more explicit in certain contexts, for example, than Chinese, because English has grammaticalized a set of

obligatory constraints on referent identification we associate with “subject” and the use of the subject to mark particular speech act types. So we use the existence of subject in a clause and the position of subject in the clause to mark whether it is interrogative, imperative, or declarative. We have this as an obligatory part of every sentence, and because of that we then have to be explicit about who is the subject of the sentence. Chinese has not conventionalized these same constraints on referent identification (LaPolla, 1993), so you don’t have to be as explicit in terms of referent identification when you say something.

Going back to the path through the field example, when you are going through the field you go a particular way because you find it expedient to go that way, but then other people start going that way and eventually the grass gets worn away to form a path, and the form of the path becomes fixed. At some point the path becomes recognized as the unmarked way to go through the field. This is true of other types of conventionalization as well. One method/tool/system for achieving a particular purpose becomes the unmarked way to achieve that purpose, and other ways are seen as marked.

In language there are several ways language structure can develop. You can develop either a particular word to constrain inference in a particular way, like the use of *lic* “like”, which developed into the adverb marking *-ly*, or it can be an extension of some pre-existing morphology for some new use, like the Qiang prefixes being extended to marking perfectives and also to imperatives. Or you can just have the fixing of structures, like in the English case where you have obligatory cross-clause co-reference in conjoined clauses. For example, Bernard Comrie once mentioned (1988:191) that if you have a sentence like *The man dropped the melon and burst*, [Audience laughs] — you laugh, because the interpretation of that pattern in English has to be that it is the man who burst, not the melon. The structure of this pattern in English has become fixed, to the point that you have this obligatory cross-clause co-reference; the subject of the second clause has to be the same as the subject of the first. The structure of *The man dropped the melon and burst* then forces a particular interpretation

by disallowing certain assumptions about what is likely or possible to be added to the context of interpretation. It has become so conventionalized it forces the listener to interpret the sentence in a particular way, even if that particular interpretation does not make sense. A lot of languages don’t do that. Even languages as closely related as Italian don’t have such obligatory co-reference. Chinese also doesn’t force such co-reference. I have asked many Chinese people over the years to translate that sentence into Chinese and tell me who or what burst, and they say “Of course it’s the melon that burst; the man’s not going to burst.” But in English it has to be the man who burst because the grammar forces that particular interpretation.

## 10. How Languages Differ in Terms of Complexity

So how do languages differ in terms of complexity? They can differ in terms of which functional domains they constrain the interpretation of. They can differ in terms of the extent to which they constrain it. And they can differ in terms of what mechanism they use to constrain it. So for example, in Chinese you can say the sentence in (12a), which is just “he/she go school”. You can leave it at that, you don’t have to add any tense marking, and you don’t have to specify if it is a man or a woman. In English you have to say “he went to school” or “she went to school”, or “he is going to school” or “she is going to school”, and so on, as in (12b–d); you have to be more specific — the grammar (the conventions of English usage) forces you to be more specific. English then differs from Chinese in that English obligatorily constrains the interpretation of the time of an action relative to the time of speaking (i.e. has obligatory tense marking, as well as obligatory gender and animacy marking for 3rd person pronouns).

(12) a. *Tā qù xuéxiào.* Chinese)  
3sg go school

b. *She went to school. / He went to school.*

- c. *She is going to school. / He is going to school.*  
 d. *She goes to school. / He goes to school.*

Now while English obligatorily constrains the interpretation of past vs. present vs. future actions, it does not obligatorily mark a difference between recent past and distant past actions. How far in the past an action happened relative to the time of speaking is left up to inference; this aspect of the interpretation is not constrained. But in Rawang, a Tibeto-Burman language of northern Burma, you have four different past tenses, and it is obligatory to constrain the hearer's interpretation of how far in the past the action was that you want to talk about. Compare the Rawang examples given in (13a–d) (from my own fieldwork).

- |         |            |           |                    |  |
|---------|------------|-----------|--------------------|--|
| (13) a. | <i>àng</i> | <i>dī</i> | <i>ám-í</i>        |  |
|         | 3sg        | go        | DIR-Intrans.PAST   | 'S/he left, went away (within the last 2 hours).'        |
| b.      | <i>àng</i> | <i>dī</i> | <i>dár-í</i>       |  |
|         | 3sg        | go        | TMhrs-Intrans.PAST | 'S/he went (within today, but more than two hours ago).' |
| c.      | <i>àng</i> | <i>dī</i> | <i>ap-mí</i>       |  |
|         | 3sg        | go        | TMdys-Intrans.PAST | 'S/he went (within the last year).'                      |
| d.      | <i>àng</i> | <i>dī</i> | <i>yàng-í</i>      |  |
|         | 3sg        | go        | TMyrs-Intrans.PAST | 'S/he went (some time a year or more ago).'              |

We can see then that English and Rawang both constrain the inference related to the interpretation of the time of the event relative to the time of speaking, unlike Chinese, but Rawang constrains it to a much greater degree. (Notice, as I mentioned earlier, that it is particular functional domains, and not languages that we should look at in terms of complexity. Here we see Rawang has more complexity in its tense system than English, but less complexity in its pronoun system, as it does not make the gender and animacy distinctions English does.)

Now in terms of the type of marking you might have, we can go back to the example I mentioned earlier about washing one's hair. I mentioned earlier that in Chinese when talking about washing hair, you don't have to say whose hair you are washing. You can just say the sentence in (14a). In most situations you wash your own hair. If you are a professional hair washer, it might mean you are washing someone else's hair but most of the time it would mean you are washing your own hair.

- (14) a. *Tā zài xǐ tóufǎ* (Chinese)  
 3sg PROG wash hair.  
 'S/he is washing (her/his) hair.' (Lit.: 'S/he is washing hair.)
- b. *He is washing his hair.*
- c. *àng nī zǐl-shì-ē* (Rawang)  
 3sg hair wash-R/M-NPAST  
 'S/he is washing her/his hair.'

In English, as in (14b), and Rawang, as in (14c), you have to be explicit, you have to say whose hair is being washed, but the way you are explicit differs between the two languages. The way you are explicit in English is to have a possessive adjective on the noun, as in *his hair*, whereas in Rawang you don't put any marking on the noun itself, you put a reflexive/middle marker on the verb, which then marks the fact that the washer and the person whose hair is being washed are the same. So both Rawang and English are constraining the interpretation, unlike Chinese, but in this case they use very different types of morphology, in one language a pre-noun genitive modifier, and in the other a post-verbal reflexive suffix.

## 11. Conclusion

To conclude, language is not an absolute necessity for communication, though without language the addressee's inferential

task in creating the context of interpretation can be quite complex. Therefore communicators attempt to simplify the addressee's task by constraining the addressee's inferential process with a more explicit ostensive act which includes the use of linguistic forms, and when the particular pattern they use to do so is repeated often enough and by enough people it can become fixed as language structure. The consequence of this is that simplifying the addressee's task complicates the communicator's task, as the ostensive act produced by the communicator has to be more complex. As each society views the world differently, communicators in different societies will differ in terms of which particular functional domains they feel the need to constrain the interpretation of, to what degree they constrain the interpretation of a particular functional domain, and what mechanism they use to constrain the interpretation. These are the differences that lead to the differences in the degree of complexity of the sub-systems of different languages.

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