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The remote island, unattested patterns and initial clusters

1. North Sentinel

Located in the Bay of Bengali closer to Myanmar than to the Indian subcontinent, the North Sentinel island belongs to the Andaman islands and like this archipelago is under Indian administration. It appears in the media when an event related to its peculiar situation occurs, such as in October 2018 when an American missionary tried to bring the Christian message to the locals but was killed by them as soon as he landed. We know what he would have told the inhabitants, but not how he would have tried to address them, for nobody knows which language they speak. In 1956 the Indian government declared North Sentinel island a tribal reserve and cast a prohibition of approaching it closer than three miles. Locals prove hostile to foreigners since the earliest record by British colonial forces in 1880, through some contact with anthropologists in the 1960s and until today when they shoot arrows at Indian government helicopters and, as in the case of a number of fishermen or the American missionary mentioned, kill everybody who sets foot on their island. Their population is estimated between 50 and 200. Nothing is known about their social organization and their system of beliefs. Or about the language they speak.

Hence it cannot be excluded that the local population prefers mating with close relatives (father, mother, brother, sister), or has an especially positive and emotionally endearing attitude towards spiders and snakes (of the kind that other populations may have towards horses, cats or dogs).

It cannot be excluded either that in Sentinelese when people ask “can eagles that fly swim?” they want to know whether eagles can fly (rather than whether they can swim). Or that in Sentinelese negation is done by word order, or that the word carrying negative meaning is always the third word of the sentence. Or that Sentinelese features closed syllable lengthening, compensatory shortening, a process that turns p into e when followed by a g, or a stress system where stress falls on the antipenultimate syllable unless the penult bears a short vowel, in which case this short vowel is stressed.

2. Are gaps accidental or systematic?

The patterns described in the preceding section are absent from the record anywhere on the globe, past and present. The question is how this should be evaluated: either their non-

occurrence is mere accident, or it stems from a rule that is consubstantial with the fact of being a human and disallows human beings to do what is not on record.¹

In the former case the empirical gap is said to be accidental, while in the latter it is systematic. Those who believe that the gaps at hand are accidental make no prediction as to what will be found on North Sentinel island. Or rather, they expect that there is actually a remote island somewhere in the past, the present or the future, where the patterns that are not on today's empirical record may actually occur: nothing withstands their instantiation in humans. By contrast those who take the current absence of the patterns at hand to be systematic gaps have a reason to believe that they are truly impossible: their theory cannot accommodate them. Hence they make the prediction that whatever is found on North Sentinel island will either replicate what is already known from the record, or instantiate a pattern that is allowed for by the theory entertained but absent from the record. That is, there was no, is no and will not be any remote island where patterns that are thought to be systematic gaps occur since they lie outside of what defines the human being.

The goal of the present chapter is to evaluate the remote island argument, which may be levelled against anybody holding that a given empirical gap is systematic: "our empirical record is incomplete: you can't be sure that the pattern whose absence you believe is systematic really does not occur because there is this remote island of which we know nothing and where it actually could be found." That is, the remote island argument excludes the existence of universals in a principled way: even if all remote islands are discovered and integrated into the record, there are remote islands in the past and in the future of which we know nothing and where things that we believe are impossible actually occur.² In other words, the remote island makes the very notion of possible vs. impossible language pointless: it can never be shown that a candidate impossible language is really impossible.

3. Chomskyan Universal Grammar

The remote island issue was raised at the outset of SPE: Chomsky & Halle (1968: 4) argue that patterns which are absent from the empirical record are of no interest if they are just accidentally absent. They illustrate their point by imagining a future war that only inhabitants of Tasmania survive. What we know today being mere accidental properties of their language (because we are aware of other languages) will then appear to be a universal to linguists studying the available empirical record. That cannot be the right move and hence, Chomsky & Halle conclude, Universal Grammar (UG) for sure allows for more patterns than those that are attested today. Some unattested patterns will turn out to be accidental, others systematic. Unfortunately, Chomsky & Halle do not indicate how both could be told apart, or what should be answered when somebody comes up with the remote island in order to refute the existence of systematic gaps, that is of UG.

Pace the remote island threat, chomskyan linguistics pursues the systematic gap perspective which is implemented in the notion of Universal Grammar (UG), or more recently the Language Faculty. Chomsky (2005) exposes the minimalist perspective on UG in terms of what makes language grow in a child: 1) information present in the environment, 2) domain-

¹ The absence of the patterns at hand from the record may be accidental for two reasons: either they have existed or currently exist and failed to be recorded, or they have never existed, in which case their non-occurrence may still be accidental (as opposed to being the result of an inherently human restriction).

² In this context "universal" is understood as a pattern that is non-occurring for principled reasons and could not be instantiated in humans. By contrast the massive literature on language universals is much about the empirical record (Comrie 1981, Haspelmath et al. 2001) and whether a given pattern is really unattested, in which case it is said to be a universal. Of course the question how the absence of patterns may be explained is also pursued (Haspelmath 2004, 2008: 78), and this is where the remote island argument kicks in.

specific genetic endowment and 3) domain-general cognitive abilities (such as categorization). Chomsky argues that the best account of language is one where the second design property is minimized to the prospect of the third: he invites analysts to seek third factor explanations based on domain-general cognitive abilities as much as they can in order to explain linguistic phenomena. That is, the less domain-specific genetic endowment plays a role, the better.

In comparison with earlier generative perspectives on UG (Government & Binding) where narrow theoretical devices such as government or X-bar were held to be genetically coded, the current take has shrunk UG, in line with the minimalist idea (for the historical evolution and current state of UG see Roberts 2016).

4. Alternative views: either G alone or both U and G dismissed

As a matter of fact, the minimalist and third factor-based evolution of UG is a move that makes the generative view largely swing in to the position that was always held by its critics, who comment "well, Chomsky finally comes to reason, this is what we always said".

Critics of chomskyan UG fall into two types: those who doubt that there is any language-specific ingredient in language (G of UG dismissed but U maintained), and those who doubt that there is anything universal in language (both G and U dismissed).

4.1. Domain-general capacities are enough: universals (may) exist

For the former group language is an exaptation of domain-general abilities that are otherwise active in the cognitive system, combined and put to use in order to produce language. This view is held for instance by Carr (2000) specifically for phonology and more generally by John Anderson (2011), the founder of Dependency Phonology: "all aspects of linguistic structure are grounded in non-linguistic mental 'substance'" (vol.3, p.1). Langackerian Cognitive Grammar also subscribes: "[c]ognitive linguistics views linguistic cognition as indistinguishable from general cognition and thus seeks explanation of linguistic phenomena in terms of general cognitive strategies" (Janda 2010: 1). In the same way, the work by Tomasello (2003: 3f) is geared to show that domain-general capacities are necessary and sufficient for language to emerge in the child.

The domain-general abilities that this view is based on (such as categorization) may well be genetically coded and hence produce universals also in language. On these assumptions the interpretation of empirical gaps is in principle not any different from their treatment when chomskyan UG is assumed: the absence of a pattern from the empirical record may be accidental or systematic. If systematic, it stems from limitations of some domain-general characteristic of the cognitive system. For example, linguistic units cannot be gradient because the cognitive system is unable to process gradiency: any continuum that occurs in the extra-cognitive world is boxed into discrete units.

4.2. Functional, cultural and usage-based approaches: no universals

The other group of UG critics dismiss both the U and the G: their perspective on language is cultural, functional and usage-based. According to the functionalist position, non-occurring patterns are not impossible but merely improbable because they would impose adverse conditions on the cognitive system, which prefers eluding extra difficulty. Thus Haspelmath (2008: 92): "[f]or functionalists, unattested languages may simply be improbable, but not impossible."

When the properties of language are held to be correlated to the culture of the speakers, there are a priori no limitations either on what a possible language may look like: culture can vary in arbitrary fashion, hence language can. The cultural perspective is endorsed for example by Everett (2005), Tomasello (2006), Haspelmath (2011) and Carr (2000).

Finally, usage-based approaches also hold that language is a conventional, rather than a natural object. Its patterns and regularities are the result of habit: whatever is frequent will be implemented (grammaticalized). In this perspective, Bybee (2001: 14ff.) explains that the only thing that makes a noun and a determiner cohabit within the same constituent is the fact that they frequently occur next to each other. Hence if a new fashion made people choose another word order, any two words that occur next to each other would become a syntactic constituent.

In this perspective there is nothing that could enforce the principled prohibition of some pattern in language. Hence the question whether gaps are accidental or systematic is a non-question: all gaps are accidental. If communicative needs, responses to the culture of the speakers, usage or other conventions require any of the outlandish-looking linguistic patterns mentioned at the end of section 1, they will come into being. Their absence from the record suggests that they are not beneficial to communicative needs, or that no culture so far has produced them.

5. Natural Phonology

5.1. Things are natural and have causes, but UG has not

Donegan & Stampe (1979: 126) lay out the perspective of Natural Phonology as follows: "its basic thesis is that the living sound patterns of languages, in their development in each individual as well as in their evolution over the centuries, are governed by forces implicit in human vocalization and perception." The factors that shape sound patterns thus include physiological properties (vocal tract anatomy) and a number of domain-general cognitive abilities relating to vocalization and perception. Donegan & Stampe (2009: 1f.) are explicit on the fact that processes respond "in real time to an innate limitation of the human faculty for fluent speech perception and production."

Donegan & Stampe believe that the very idea of UG is misled and, to the extent that its content may be identified, uninformative. The goal of inquiry about language, they contend, should be explanation, rather than description. The generative ambition to discover a means to generate all and only those languages that are possible is descriptive in kind: the day we possess this algorithm and know about the content of UG, we still do not know why the algorithm is the way it is, why UG has the properties it does, rather than any others. Hence Natural Phonology "is intended to *explain* its subject matter, to show that it follows naturally from the nature of things; [...] it is not intended to *describe* its subject matter exhaustively and exclusively, i.e., to generate the set of phonologically possible languages." Donegan & Stampe (1979: 127, emphasis in original)

5.2. Natural, universal and innate (processes) vs. conventional and learned (rules)

Natural Phonology makes a difference between natural and conventional events. The former are called processes, the latter rules. Processes are natural, innate and universal because they are based on what is shared by all humans: physiology, the perceptual and the vocalizing systems. They are a product of the speaker. Hence "Phonological processes are innate and universal – not in the sense of "Universal Grammar", but rather in the sense that they are natural responses to the phonetic difficulties encountered in speaking. They are universal

because the human vocal and perceptual apparatus is universal – not because they are somehow part of the human brain." Donegan & Stampe (2009: 6)

Rules on the other hand are arbitrary and can only be learned from the environment: this is where language-specific properties such as parametric variation, inventories, culture, social aspects and other artefactual factors come in. Rules are not a property of the speaker, but of the language.

Hence unlike in generative quarters, computation in Natural Phonology is teleological, as least as far as processes are concerned. The overall picture then is a trade-off that manages a mixed bag of a number of potentially conflicting factors: intentions of the speaker (i.e. the externalization of a lexical unit), phonetic difficulties encountered, social and cultural demands, register, style, communicative needs and so on (Donegan & Stampe 2009: 12). In case of conflict, Dressler (1999: 135) says that agents (speakers) will favour behaviour that is "cognitively simple, easily accessible (especially to children), elementary and therefore universally preferred, i.e. derivable from human nature, or unmarked/less marked".

5.3. Gaps are never systematic

In conclusion, the continuous trade-off among processes and of processes with rules that Natural Phonology (or Natural Linguistics) provides for leaves space for a cross-linguistic variation that is in principle unbounded. Natural Phonology thus endorses the regular functionalist position (section 4.2): "[a] model of NP claims fewer absolute than relative extraphonological constraints on phonology; these do not exclude phenomena, but rather render them costly so that they occur infrequently" (Dressler 1984: 31). Therefore Dziubalska-Kołaczyk (2001: 69f.) says that "absolute predictions with reference to language behaviour (if not in general) are impossible."

Hence for any pattern, however outlandish, Natural Phonology can conceive of a remote island where it occurs.

6. Word-initial clusters

6.1. Beats and Binding theory

Since 2001 Katarzyna Dziubalska-Kołaczyk has developed the Beats and Binding framework (B&B), a theory of phonotactics couched in NP (Dziubalska-Kołaczyk 2001, 2002, 2009, 2014 among other references). The essence of this theory is to define universal preferences for the co-occurrence of consonants and vowels, with a particular focus on consonant clusters. Cluster preferences depend on their position in the word, i.e. initial, medial and final. For a given position, they may be optimal (best), tolerable, intolerable or impossible (Dziubalska-Kołaczyk 2001: 79, 2002: section 5.1). Dispreferred clusters are possible, though dysfunctional in a given position. Sonority decides about the quality of clusters: "[t]he Optimal Sonority distance Principle defines the way in which segments should order themselves in a successful sequence" (Dziubalska-Kołaczyk 2001: 79). In more recent work (Dziubalska-Kołaczyk 2014), sonority distance was replaced by the more fine-grained NAD (Net Auditory Distance), which calculates the distance of two segments based on their place and manner of articulation.

Relevant for the remote island question are the impossible clusters mentioned, which Dziubalska-Kołaczyk (2002: section 5.1, note 108) says "are excluded on logical grounds by well-formedness conditions". Dziubalska-Kołaczyk (2002: section 17.3) discusses a case in point, using the asterisk typical of generative practice: $\ast\{BNn\}$ and $\ast\{nNB\}$ are impossible in all languages. $\{BNn\}$ translates as a sequence of a vowel (B) followed by a syllabic consonant

(N) and a non-syllabic consonant (n) such as in *art, while the mirror image {nNB} stands for a non-syllabic consonant (n) followed by a syllabic consonant (N) and a vowel (B) as in *tra. Hence r in atr and rta will tend to become syllabic, but it will not be syllabic in art or tra.

However, "impossible" in B&B theory means "impossible in the realm of a given domain" (here cluster well-formedness). Other phonological or extra-phonological factors may well outrank such impossibilities, as Dziubalska-Kołaczyk (2002: section 5.1) explains. For example, morphological influence may override phonological well-formedness (Dziubalska-Kołaczyk 2014: 11ff.). Indeed the outlawed sequence {nNB} does occur in English in a word like *twinkeling* [twɪŋklɪŋ] "the act of twinkeling" where the liquid is syllabic, as opposed to *twinkling* [twɪŋklɪŋ] "a short moment", where it is not. The phonological difference is due to different morphology, i.e. two different *-ing* constructions which also produce the difference in meaning (Marvin 2002: 36ff.).

6.2. TR-only vs. anything-goes

Some languages restrict word-initial clusters to TR (T is shorthand for obstruents, R for sonorants) or a subset of R therein (typically *muta cum liquida*, i.e. T+liquid), while others allow for both TR and RT (as well as for TT and RR). Let us call the former TR-only and the latter anything-goes languages. English, Spanish or German are examples of the former, Polish and Moroccan Arabic of the latter. There are no RT-only languages on record, though, i.e. where word-initially only RT, TT and RR clusters occur, but no TRs.

There is evidence from speaker judgements that the absence of RT in TR-only languages is systematic, rather than accidental. Since Chomsky & Halle (1965: 101) the canonical example rehearsed is the difference between the words *blick* and *lbick*. Neither are actual English words, but the attitude that natives show when confronted with them is different: while they will be reluctant to accept *lbick* as a possible word, they have no objection against *blick* entering the language at any time if it acquired a meaning. By contrast speakers of anything-goes languages such as Czech, Polish or Moroccan Arabic adopt the latter attitude for both *blick* and *lbick*: they may prefer one over the other, but will not declare either being an impossible word in their language.

Grammaticality judgements are an interesting and for many analysts a conclusive way of determining whether a given gap is accidental or systematic. But alas they are limited to individual languages because you need native speakers to perform them. When talking about typology, the remote island and universally impossible patterns, we are talking about languages whose existence we try to assess, but which do not actually occur to our knowledge—hence there are no native speakers to ask. Therefore grammaticality judgements are inoperative for typological matters.

It could thus be the case that natives on the remote island like *lbick* but reject *blick*. This is all in line with NP: a particular trade-off between phonological and extra-phonological factors produces the TR-only restriction in English grammar, but on the remote island a different trade-off may produce an RT-only restriction (all words must begin with RT, TT or RR clusters).

6.3. Initial RT clusters in Slavic

Let us now consider existing anything-goes languages and the RT clusters that actually occur in them. I have attempted to establish a data base which provides an exhaustive record of all words that begin with a sonorant-obstruent cluster in 13 Slavic languages.³

³ <http://tscheer.free.fr/papers/Slavic%20RT%20v5.2%208-06.pdf>.

The result shows that every Slavic language makes its own selection among #RT clusters (Scheer 2007, 2012: §320): their number may range from zero (Bulgarian, Macedonian, Slovenian, Belarusian) over "almost none" (Sorbian 1,4, Kashubian 4), "some" (Slovak 8) and "quite some" (Ukrainian 12, Russian 16) to "a whole lot" (Polish 20, Czech 28). No language, however, attests the full set of logically possible #RT clusters. Even the most permissive system is far from that: Czech attests 28 combinations out of 108 possible clusters (6 sonorants, 18 obstruents), which amounts to 26%.

This situation strongly contrasts with the one that is found in TR-only languages where all possible stop-liquid clusters are instantiated (save the notoriously missing #tl, #dl). The question then is whether the missing RT clusters are an accidental or a systematic gap imposed by the grammar of the languages at hand. Beyond the evidence coming from speaker judgements (speakers do not object against new words with non-existing RT clusters), there is reason to believe that the gaps are accidental. For one thing, all attempts at parsing the #RT-set of any of the #RT-displaying languages into a natural class are vain. Whatever the criterion or the feature or combination of features used (sonority, nasality, place etc.), all #RT-sets will resist exhaustive assignment: some clusters that according to the candidate natural class should exist are absent, while others that should be outlawed do occur. Polish is by far the best studied Slavic language as far as phonology is concerned, and trying to make sense of the occurring and non-occurring initial clusters is some kind of national sport in Poland. Starting with Kuryłowicz (1952), there is a long empirical and analytic tradition including Dziubalska-Kołączyk (2014) (for further references see Scheer 2007, 2012: §320).

No criterion was found that could tell occurring from non-occurring clusters. We are thus left with an anarchic picture that no principle seems to be able to explain. It may be argued that progress in phonological theory will shed light on the mystery at some point, but this is not very likely since we are talking about basic descriptive categories (sonority, place, manner etc.) that will not change, rather than theory. Haspelmath (2004) makes this point regarding the difference between descriptive and cognitive universals.

6.4. The accidental and the systematic in initial clusters

Let us now compare the two empirical gaps related to initial clusters that were discussed.

- (1) unattested configurations in initial clusters
 - a. RT-only
a language where all word-initial clusters are RT, TT or RR (i.e. non-TR).
 - b. Slavic full RT
a Slavic language where all logically possible combinations of initial RT clusters are attested.

It was shown that the anarchic picture of Slavic initial RT clusters is good reason to believe that (1)b is an accidental gap. Note that there are languages where all logically possible initial RT clusters really occur: Moroccan Arabic is a case in point (Scheer 2007: 348f, 2012: §318).

By contrast (1)a has a clear rationale: occurring and non-occurring patterns are divided by simple sonority. The sonority generalization at hand is merely descriptive in the sense of NP: there is no obvious reason why there are TR-only, but no RT-only languages. Even in case Dziubalska-Kołączyk's NAD-based calculus is able to divide the cluster space into TR vs. RT, TT, RR, the question is why extra-phonological factors have not overridden the purely phonological/phonetic NAD rule in any language.

Given the descriptive distinction between (1)a (clear sonority-based rationale) and (1)b (anarchic pattern), I have concluded that there are only two possible grammars for natural

language regarding initial clusters (Scheer 2007, 2012: §313): TR-only and anything-goes. These options are hard-wired, i.e. enforced by properties of UG that no extra-phonological factor can override. Hence the absence of RT-only languages is a systematic, not an accidental gap. Within the two possible grammars, though, there is a range of variation and languages may devise their own sub-regularities. One of these regarding TR-only languages is whether R can be a nasal or not (Old English: yes, Modern English: no, e.g. #kn as in *knight*). Here again, the clear rationale governing the non-occurrence of #TN (nasals in second position) qualifies the gap for being systematic.

By contrast in a language that tolerates non-#TR clusters, all gaps are accidental: this is the case when the gaps have an anarchic distribution as in Slavic languages.

7. If you play the remote island, you have to play it all through

The remote island is a foundational argument in the work by Mark Hale and Charles Reiss, who are firm representatives of chomskyan self-contained grammar on which extra-linguistic factors have no bearing. Hale & Reiss (2008: 2-6) distinguish attested (Japanese today) and attestable languages (Japanese in 2000 years, Sentinelese). The former is a proper subset of the latter. Which in turn is a proper subset of what Hale & Reiss call humanly computable, i.e. languages that carry out computation which is neither attested nor in all likelihood attestable, but provided for by UG. They argue that such a case may arise because of diachronic change: in order for a rule such as $p \rightarrow e / __g$ to exist it would take a specific telescoping of independent diachronic events whose conjunction is highly improbable and therefore may never actually occur. Regarding another pattern of this kind, Reiss (2003: 328) says "I am not claiming that the two unattested conditions are in principle uncomputable by the phonological component of the mind, but rather that the nature of language transmission makes it unlikely that they will arise".

Up to this point, Hale & Reiss very much adhere to the Natural Phonology position, and to functionalist approaches in general: there is always a remote island for unattested patterns, which may be not only unattested but also unattestable (in past, present and future) because of extra-grammatical factors. Their occurrence is thus highly improbable, but not impossible.

In contrast to Natural Phonology and other functionalist approaches, though, Hale & Reiss believe that there are in fact patterns which do not have a remote island. The question then is the one that is familiar by now: how do we know that an (unattested and probably unattestable) gap is accidental or systematic?

- (2) "It also seems clear that one could define computational systems which operate over linguistic representations which we do not want UG to be concerned with. For example, there is no evidence that the language faculty makes reference to prime numbers, so we do not want to build into UG the power to express rules lengthening vowels in prime-numbered syllables. Similarly, there seem to be no languages that reverse word order to form interrogative sentences, although such a language is trivial to describe." Hale & Reiss (2008: 2)

The reason why reference to prime numbers lies outside of UG, Hale & Reiss say, is that we do not want UG to be concerned with prime numbers. Hence what lies inside or outside of UG is a matter of a prior decision of the authors, expressed as a wish. Hale & Reiss add that there is no evidence for languages making reference to prime numbers or reverse word order. This is certainly true, but there is no evidence for a $p \rightarrow e / __g$ rule either. Hale & Reiss thus contend that there is a remote island for the latter, but not for prime numbers or reverse word order, and the reason for this is that they have decided so. Some analyst who likes prime

numbers and reverse word order but not the rule $p \rightarrow e / __g$ could decide the reverse, on exactly the same empirical grounds. Going about UG like this makes it a matter of personal taste and gut feeling: there will be as many different UGs as there are individuals with different wishes, and no argument will be able to referee the different positions.

There is no rational way of distinguishing between those unattestable patterns that Hale & Reiss believe are computable by UG and those that they believe lie outside of UG. The remote island argument is exactly the same for prime numbers and the crazy rule mentioned, or any other unattested pattern for that matter. If there is a remote island for the crazy rule, there is one as well for prime numbers. We thus fall back on the functionalist position: there are no systematic gaps, there are just patterns that are more or less likely to be found.

8. Not that different after all

In sum, it appears that chomskyan and functional approaches (at least of the NP type) may share more than what is suggested by the often controversial debate (this is also the conclusion of Haspelmath 2008). Some relevant properties are shown under (3).

- (3) chomskyan and functional approaches to universals and the notion of "possible language"
 - a. Agreement #1
There are innate (i.e. genetically coded), universal and specifically linguistic (i.e. domain-specific) properties of language.
 - b. Agreement #2
There are extra-grammatical factors that bear on language, some of which are cognitive in kind (domain-general).
 - c. Agreement #3
Some gaps in the empirical record stem from extra-grammatical factors and are accidental: there is a remote island for these patterns, but it is improbable that this island will ever be found.
 - d. Disagreement
The disputed issue is whether genetically coded properties of language, domain-specific or domain-general, may be counteracted by other factors. Chomskyan analysts say no (hence the gaps produced by these properties are systematic), while functional analyses say yes (the gaps at hand are accidental, like all others). For the former group there is no remote island for gaps created by genetically coded properties of language, while for the latter there is.

9. The remote island is either trivial or irrelevant

Depending on the position one takes regarding the disagreement (3)d, the remote island is either trivial or unhelpful. For analysts holding the functional position it is self-evident since all gaps have a remote island anyway: there is nothing that couldn't exist. For analysts of chomskyan persuasion who will want to find out which gaps exactly are accidental and which ones are systematic, the remote island does not do any labour: any gap may be threatened with the remote island and hence turn out to be accidental. Worse, we know in advance that whenever the remote island is levelled against a systematic gap candidate, there are no possible arguments that could be made in either direction and we will never find out. Hence either the chomskyan idea that there is something like a possible language and systematic

gaps is abandoned altogether (in recognition of the remote island), or the remote island argument needs to be ignored.

A popperian insight is that the less restrictive a theory is, the worse. Bad theories say "there is an X such that...", good theories say "for all X, ..." A theory claiming that pink elephants exist (on the remote island) is a bad theory and scientifically irrelevant because it is not falsifiable. Hence those who believe that there are systematic gaps can and should ignore the remote island and go only by positive evidence: all gaps are considered systematic unless there is good evidence to the contrary.

What such evidence may look like was shown in section 6.4: chaotic gaps that make no sense according to any descriptive device (initial RT clusters that are absent in Slavic) provide good reason for an accidental status. By contrast gaps which make sense in terms of an established criterion like sonority (absence of RT-only languages) stand a better chance to be systematic.

Another example are crazy rules, i.e. which make no phonetic sense. The one mentioned in section 7 is a case in point: $p \rightarrow e / __g$. Studying the literature on crazy rules, though, it appears that they are only ever segmentally crazy (Scheer 2015, Chabot 2019). That is, rules which turn segments into other segments without this making any sense, triggered by contexts that do not make sense either, are on record (e.g. $l \rightarrow \text{ɛ}/\text{ɪ} / V__V$ in Sardinian). But rules doing crazy syllabic operations or crazy stress assignment are not: there is no closed syllable lengthening (all vowels in closed syllables lengthen), compensatory shortening (vowels shorten when a neighbouring consonant falls out), tonic shortening (all tonic vowels shorten) or stress assignment whereby stress falls on the antipenult except when the penult is light, in which case the penult is stressed (anti-Latin stress). If extra-grammatical factors are responsible for the introduction of craziness into patterns, there is no reason why they only ever mess up segmental order. For analysts who want to tell accidental from systematic gaps, then, there is a remote island for segmental phonology, but not for syllabic and stress-based patterns.

10. The knowable and the unknowable

Since Donegan & Stampe (1979: 127), the heart of the NP critique of chomskyan UG is that science is about discovering causalities, not about describing what occurs and what does not (section 5.1). The issue raised taps into the philosophical debate of whether or not there are things in nature that are unknowable – unknowable by human endeavour in principle and for all times, not just because of past, present or future circumstances such as insufficient technological advance (see philosophy of mind textbooks such as Braddon-Mitchell & Jackson 1996: 8-10).

René Descartes' mind-body dualism makes a case for the existence of the unknowable. Because of that Descartes was charged for having reintroduced God through the back door when rationalist thinking was about getting God out of the picture (hence say 18th century materialists, he is a traitor to rationalism). Along the same dualist lines is Kant's *thing by itself* (noumenon): Kant argues that man will never know what the world is made of since he will never possess evidence that has not gone through his perceptual system where the sensory input is modified. Today there is experimental evidence to the end that this is indeed the case: the McGurk effect (McGurk & MacDonald 1976) for example describes a perceptual illusion whereby subjects perceive something that was not in their sensory input (they hear *da* when the audio input is *ba* and the synchronized visual input *ga*).

Fodor's (1983) *Modularity of the Mind* has produced a debate about the unknowable. According to Fodor the mind is made of modules and central systems: the former are domain-

specific, innate, rapid, error-shielded and non-teleological (perception systems, language). They are the construction workers of the latter, which are teleological and make decisions. Fodor is pessimistic about our ability to understand how central systems work: he assumes that they are resistant to scientific theorising and ultimately to human understanding because they cannot be appraised through the modular prism: "the more global [...] a cognitive process is, the less anybody understands it" (Fodor 1983: 107). The opposing view is taken by Pinker (1997), Sperber (2001) and others: these authors believe that central systems are not out of reach and that their workings may be understood. According to Sperber's Massive Modularity, central systems will turn out to be modular as well. Fodor (1987: 27) calls this the "modularity thesis gone mad" (Fodor 2000 is all about that issue).

Chomsky sides with Fodor, for cognitive matters and more generally speaking in science.

- (4) "If you look at physics, or the history of ideas, or the theory of evolution or whatever, it seems to me that no reason has been advanced to lead us to suppose that we can find answers to the questions we can pose except in certain very narrow domains. It could turn out that questions of this sort lie beyond the bounds of the specific biological system which is human intelligence." Chomsky (1984: 7)

Hence according to Chomsky it is not the case that everything in nature in general, and in language in particular, has a cause. Or rather, has a cause that man can understand. On this view it is consistent to believe that properties of UG have no cause, at least none that humans will be able to identify. Therefore the objection against UG saying that everything including UG has a cause that needs to be identified does not bite: UG may be one of those things in nature that are irreducible to anything else and for which a description is as far as scientific inquiry can get.

The existence of this kind of irreducible properties that make no sense and have no cause is undisputed in natural science: there are dozens of so-called physical (or natural) constants that shape the laws of physics, chemistry and biology, among which the speed of light c , the gravitational constant G , the Planck constant h , the elementary charge e or the mathematical constant π . They do not follow from anything and the undisputed understanding in scientific quarters is that determining their values is all that humans will be able to know about them. Asking why they are as they are is a question raised by those who have a transcendental agenda: "intelligent design" is the idea that the subtle interplay of all these natural constants which allow the Universe to exist cannot be accidental: there must be a superior being who has arranged them in the way they are.

But even if functionalists went along with the idea that UG is a kind of natural constant whose *raison d'être* is not a possible object of inquiry, they do not need to accept the existence of systematic gaps. This is because of (3)d: universal, innate and domain-specific properties of language may be outranked by extra-grammatical factors. Pursuing the parallel with the natural sciences, defenders of UG reply that we know from physics, chemistry and biology that certain laws are absolute and immutable no matter what human, animal, cultural or teleological pressure they face. Gravity for example suffers no exception or amendment due to any of the factors mentioned, not any more than, say, the speed of light.

This is in fact what Haspelmath (2008: 78) contends: "all cognitive universals must be at the same time phenomenological universals because structures that are not cognitively possible will not show up in speakers' behaviour."

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