Phonological Externalization of Morphosyntactic Structure: Universals and Variables[*]

Hisao Tokizaki

Sapporo University

ABSTRACT.   This paper illustrates our research project "Phonological externalization of morphosyntactic structure: universals and variables."   It is argued that externalization of syntactic structure as phonological representation will contribute to the minimalist program (Chomsky 1995, et seq.) by limiting parameters to phonology and replacing formal features with phonological properties.

Keywords: minimalist, parameter, typology, feature, variation

1. Introduction

The purpose of this paper is to describe our research project "Phonological Externalization of Morphosyntactic Structure: Universals and Variables."   The goal of this project is to clarify the externalization of hierarchical morphosyntactic structure as linear phonological objects.   We aim to construct a theoretical model where morphosyntactic structure is universal while variations between languages are limited to phonology. Following Tokizaki (2011a), and Tokizaki and Dobashi (2013), we call this model of grammar Universal Syntax and Parametric Phonology (USPP).

This model tries to explain a wide range of linguistic phenomena in a unified way.   We plan to replace the parameters assumed in morphosyntax with parameters in phonology or at the syntax-phonology interface.   This model makes it possible to characterize linguistic universals and variations in terms of minimal mechanism in the minimalist framework (Chomsky 1995).   In section 2, I illustrate the background of this project.   Section 3 explains the scope of the project.   In section 4, I show some prospects for this project and conclude the discussion.

2. Background of the project

2.1 From the principles and parameters theory to minimalism

Government and Binding theory (Chomsky 1981) tried to capture universal properties of languages in terms of principles, while the variation between languages was ascribed to parameters in the computational system of languages. For example, the universal structure of constituents was defined by X-bar theory while the linear order of constituents was ascribed to the head-directionality parameter (head-initial or head-final). In order to explain the syntactic differences between two sets of languages, researchers have proposed a number of parameters, including the pro-drop (null subject) parameter, the polysynthesis parameter (Baker 2001: 183) and the compounding parameter (Snyder 2001).

From the early 1990s, generative linguists started to ascribe language variation to a detectable system that lies outside of narrow syntax. Chomsky (2001: 2) suggests the Uniformity Principle (1) as a guideline for study.

(1)   In the absence of compelling evidence to the contrary, assume languages to be uniform, with variety restricted to easily detectable properties of utterances.

Here, citing Jean-Roger Vernaud's Case theory and Hagit Borer's hypothesis, Chomsky considers properties of morphology and lexicon, primarily inflectional. As Berwick and Chomsky (2011: 37) point out, it is plausible that morphology and phonology, which externalize internal syntactic objects to the sensory-motor system, play an important role in explaining the variation in languages. Here phonology is added as a candidate for the locus of language variation.

Boeckx (2011) strengthens Chomsky's Uniformity Principle (1) and proposes the Strong Uniformity Principle (2).

(2)   Principles of narrow syntax are not subject to parameterization; nor are they affected by lexical parameters.

Although the Strong Uniformity Principle (2) does not specify the locus of variation in the grammar, Boeckx (2014, Chapter 4) argues that parameters should be attributed to morphophonology and the interface at PF. He argues against the idea of lexicon as the locus of parameters.[1]

Tokizaki (2011a), and Tokizaki and Dobashi (2013) argue that syntax is universal while phonology is parametric. I propose that variations between languages are limited to phonology and its interface with syntax at PF. This is a strong principle about the locus of variation in the world's languages, which can be formulated as Universal Syntax and Parametric Phonology (USPP) (3).

---

[1] See Andrade (2015) for a review of Boeckx (2014).

(3)   Syntax is universal and phonology is parametric: languages are uniform, with variety restricted to phonological externalization.

Here phonological externalization means phonology and its interface with morphosyntax. USPP (3) does not mention morphology because morphology may include computation as well as lexical forms, as argued in Distributed Morphology (e.g. Harley 2011) and other frameworks, including Ackema and Neeleman (2004).   If there are computational operations in morphology, they are to be included in 'syntax' in USPP (3).

Some studies have proposed replacing syntactic parameters with phonological differences between languages. For example, Tokizaki (2011b), and Tokizaki and Kuwana (2013b) argue that the head-directionality parameter and the compounding parameter can be derived from word-stress location in a language. It seems possible to extend this idea to the polysynthesis parameter.   Richards (2014) proposes that the pro-drop parameter is derivable from the position of metrical boundaries.

2.2 From features to output condition

A point related to the discussion of parameters is the reconsideration of the formal features that have been proposed for syntactic phenomena, such as movement.   A promising research agenda is to try to replace syntactic features with phonological features or mechanisms. For example, Richards (2010) argues that the presence or absence of overt wh-movement depends on the difference in prosodic phrasing between languages. He argues against the traditional idea that wh-feature decides the movement.   If uninterpretable features are necessary only for explaining overt movement, it is more desirable to eliminate them in the theory by ascribing the trigger of movement to some property in phonology. Richards (2014) also tries to extend his phonological analysis to two more kinds of overt movement, i.e. head-movement and A-movement to the specifier of TP.

In studies in generative syntax, syntactic features such as EPP have played central roles in explaining word orders and movement.   For example, Biberauer, et al. (2008, 2014) have proposed the Final-Over-Final Constraint (FOFC) that prohibits non-existent word orders in terms of syntactic EPP.   However, Tokizaki (2010) shows that FOFC can be generalized into a phonological constraint that also covers the No Phrase Constraint (Aronoff 1976) and the Head-Final-Filter (Williams 1982).   Our project makes it possible to derive these syntactic phenomena without syntactic features.

Another possibility for eliminating formal features is found in conditions on linearization. Kayne's (1994) antisymmetry of syntax proposes Linear Correspondence Axiom (LCA),

which assumes that asymmetrical structure can be linearized properly at PF.   Assuming the antisymmetry, the relation between structure and movement has been investigated by Moro (2000), Barrie (2011) and Bauke (2014).   These studies can also do away with formal features triggering movement.

In addition to syntactic features, features about information structure have been proposed in the literature.   Studies have shown that these kinds of features can be dispensed with by phonological analyses.   For example, Erteschik-Shir (2005) and Hosono (2013) propose a phonological analysis of Scandinavian Object Shift, which is analyzed with focus feature in Holmberg (1999).

2.3 What we have done and what we need to do

We have been investigating the externalization of morphosyntactic structure as phonological objects.   The results of the workshop "Linear information across grammar" at the 28th Conference of the English Linguistic Society of Japan (2010) have appeared as Tokizaki (2011a, b), Nasukawa (2011) and Shiobara (2011).   A symposium, "The syntax-phonology interface" at the 29th Conference of the English Linguistic Society of Japan (2011) was developed as an issue of *Linguistic Analysis* entitled "Universal syntax and parametric phonology" (vol. 38 (3-4), 2013, ed. by Hisao Tokizaki and Yoshihito Dobashi), which includes eleven papers by the four panelists in the symposium, as well as some other researchers of this topic.   One of the results of these studies is shown in Tokizaki (2011b), Tokizaki and Kuwana (2013b) and Tokizaki (2013), who argue that word-stress location correlates with the head-complement order and recursivity of compounds in the world's languages.   It is clear that we have not shown the general architecture of externalization, and we need more studies from a wide range of perspectives to theorize the idea.

The syntax-phonology interface has been studied under four subcomponents separately: (i) linearization, (ii) the relation between syntax and morphology, (iii) the relation between syntax and phonology, and (iv) phonological reanalysis of the phenomena that have been analyzed in syntax.   This project recapitulates the results of the previous studies on this topic and points out the remaining issues.   We investigate how we can ascribe the variability of languages to the externalization process.   The goal of this project is to show the whole picture of externalization, which provides a new perspective for the generative theory of linguistics.

Assuming that computation in syntax is uniform irrespective of language, this project aims to clarify the properties of computation and their relation to morphophonology in the externalization of syntactic objects as PF (phonetic form).   We would like to propose a

theoretical model for the relation between components of grammar, properties of parameters and the status of each component in mapping.   I illustrate each point in turn below.

3. The scope of the project

3.1 The relation between components of grammar

In this section, I illustrate the scope of the project.   First we need to consider the relation between components of grammar. We investigate (i) the relation between syntax and morpho-phonology, (ii) the relation between morphology and phonology, (iii) the direction of interactions (Is syntactic information transmitted to morpho-phonology in unidirectional form?   Or is information transmitted interchangeably between these components?).

As for the syntax-morphophonology interface (i), Shiobara (2010, 2011) proposes that phonology constrains word order in linearization, and Inaba (2009) discusses the syntax and phonology of clausal complements in German.   As for the morphology-phonology interface (ii), Nasukawa (2011) proposes a phonological representation without precedence relation. As for the direction of interface, Tokizaki (2008) proposes bare mapping from syntactic structure to phonological representation while Tokizaki (2011b, 2013), Tokizaki and Kuwana (2013a, b) and Richards (2010, 2014) argue that phonology decides word order and movement.   Based on these studies, we would like to show that phonology affects syntactic structure much more than has been argued in generative syntax.[2]

3.2 Properties of parameters

The second topic in this project is to consider the properties of parameters and discuss what kind of mechanism is needed in order to explain the differences between languages in the world. Kayne (2011) argues that there is no head-directionality parameter in syntax. Boeckx (2014) discusses the problems of replacing parameters with some other mechanisms in the minimalist framework. Tokizaki (2011b, 2013), and Tokizaki and Kuwana (2013b) argue that the head-directionality parameter and the compounding parameter (Snyder 2001) can be dispensed with if we successfully derive these variations from phonology, especially from the word-stress location in the language. Richards (2010) claims that a number of syntactic phenomena can be ascribed to phonological distinctness in linearization of syntactic objects and that *wh*-movement can be overt or covert depending on the prosody of a language. By continuing this line of research, we aim to replace all the syntactic parameters with

---

[2] We need to consider the problem of 'look ahead' when we argue that phonology affects syntax.   A possible solution is to make phonology work as output conditions on the syntactic derivation.

phonological parameters.

Assuming that differences can be ascribed to phonology, we need to show what kind of phonological properties decide morphosyntax.   Merely replacing the problems in syntax with the problems in phonology cannot be a solution.   If there is correlation between phonological properties (cf. Auer 1993), we would like to show which property decides which other properties.   Then, we can decrease the number of phonological 'parameters' that must be learned by children in language acquisition.

3.3 The status of each component in linearization

Assuming the autonomy of each prosodic category, Dobashi (2013) proposes that the mapping from syntax to phonology proceeds derivationally step by step to make each prosodic domain in the prosodic hierarchy.   This idea supports the formulation of recursive prosodic hierarchy proposed by Ito and Mester (2012) based on empirical grounds.   Selkirk (2011) proposes Match Theory, which is taken as a theoretical base by Richards (2014).

Following this line of proposals, we can ascribe language variation to the recursiveness of prosodic categories at each step of derivation.   This leads to the construction of a linguistic theory with a broad perspective and to a clarification of the nature of parameters in prosody.

We also aim to build a model of externalization where syntactic objects are universal at each step derived by Merge while the derivation is selected that observes phonological constraints in the language.   We plan to verify this model of externalization by investigating phonological phenomena, compounding, word order, the optionality of movement and linguistic typology.

3.4 Typology and databases

I would like to mention that we now have a number of databases available for typological research on externalization.   First, we can use the World Atlas of Language Structures (WALS) Online (2013) (http://wals.info) edited by Matthew S. Dryer and Martin Haspelmath, which provides us with data on 144 features in 2,679 languages in the world.   Although WALS needs a lot more data for it to be completed, it gives us a general perspective on the world's languages.   Second, StressTyp2 (http://st2.ullet.net) edited by Rob Goedemans, Jeffrey Heinz and Harry van der Hulst contains "information on stress and accent patterns in over 750 of the world's languages with nearly every language family represented."   Third, Syntactic Structures of the World's Languages (SSWL) (http://sswl.railsplayground.net) illustrates 112 syntactic properties of 259 languages.   This database, which is run by the

linguistics department at New York University, contains useful information about topics often discussed in generative syntax.

Although these databases are still in progress, they are useful when we consider the applicability of our theoretical model of externalization.   We can also contribute to them by reporting the data in undescribed languages that are relevant to our topics.

4. Conclusion

The mapping from syntax to phonology has been studied separately in each module of grammar, such as morphology and phonology.   Although some research projects have been done on the whole picture of grammar, they are mainly theoretical and do not include enough data to verify their models on empirical grounds.   We need to investigate the mapping from syntax to phonology from various points of view.   We aim to clarify the general properties of externalization and show what kind of information is necessary for externalization. When the externalization process is identified, we can reveal the properties of core syntax.

As we have seen, the variety of languages has been dealt with by using morphosyntactic parameters.   We are trying to derive the variety of languages from phonological parameters. If this is possible, we can establish the universality of syntax by restricting the variables to phonological differences in languages.   One way to show the range of possible languages is to build a hierarchy of phonological parameters (cf. Baker (2001) for a hierarchy of morphosyntactic parameters).   This line of research can tell us the range of possible and probable languages discussed in Newmeyer (2005).

It has been argued that phonology plays an important role in language acquisition (Nespor et al. 1996).   Our project can give theoretical support for the role of phonology in acquisition.   It is also possible to extend our analysis to the study of language change if we assume that historical change is triggered by changes in the value of parameters.   Again we can explain language change in terms of phonological change.

I hope that this project will garner many contributions from a wide range of fields in linguistics and its related sciences.

References

Ackema, Peter and Ad Neeleman. 2004. *Beyond morphology: Interface conditions on word formation.* Oxford: Oxford University Press.

Andrade, Aroldo. 2015. Review of *Elementary syntactic structures* by Cedric Boeckx. Linguist List 26.3589, May 07, 2015. Online: https://www.linguistlist.org/issues/26/26-3589.html.

Aronoff, Mark. 1976. *Word formation in generative grammar*. Cambridge, Mass.: MIT Press.

Auer, Peter. 1993. Is a rhythm-based typology possible? A study of the role of prosody in phonological typology. *KontRI Working Paper* 21, Universität Konstanz. Online: http://paul.igl.uni-freiburg.de/ auer/userfiles/downloads/Phonotypo_Kontri1.pdf.

Baker, Mark C. 2001. *The atoms of language: The mind's hidden rules of grammar*. New York: Basic Books.

Barrie, Michael J. M. 2011. *Dynamic antisymmetry and the syntax of noun incorporation*. Dordrecht: Springer.

Bauke, Leah S. 2014. *Symmetry breaking in syntax and the lexicon*. Amsterdam: John Benjamins.

Berwick, Robert C. and Noam Chomsky. 2011. The biolinguistic program: The current state of its development. *The biolinguistic enterprise new perspectives on the evolution and nature of the human language faculty*, ed. by Anna Maria Di Sciullo and Cedric Boeckx, 19-41. Oxford: Oxford University Press.

Biberauer, Theresa, Anders Holmberg and Ian Roberts. 2008. Structure and linearization in disharmonic word orders. *WCCFL* 26, 96-104.

Biberauer, Theresa, Anders Holmberg and Ian Roberts. 2014. A syntactic universal and its consequences. *Linguistic Inquiry* 45, 169–225.

Boeckx, Cedric. 2011. Approaching parameters from below. *The biolinguistic enterprise: New perspectives on the evolution and nature of the human language faculty,* ed. by Anna Maria Di Sciullo and Cedric Boeckx, 205–221. Oxford: Oxford University Press.

Boeckx, Cedric. 2014. *Elementary syntactic structures: Prospects of a feature-free syntax.* Cambridge: Cambridge University Press.

Chomsky, Noam. 1981. *Lectures on government and binding: The Pisa lectures*. Dordrecht: Foris.

Chomsky, Noam. 1995. *The minimalist program.* Cambridge, MA: MIT Press.

Chomsky, Noam. 2001. Derivation by Phase. *Ken Hale: A life in language*, ed. by Michael Kenstowicz, 1–52. Cambridge, Mass.: MIT Press.

Dobashi, Yoshihito. 2013. Autonomy of prosody and prosodic domain formation: A derivational approach. *Linguistic Analysis* 38, 331-355.

Erteschik-Shir, Nomi. 2005. Sound patterns of syntax: Object shift. *Theoretical Linguistics* 31, 47-93.

Harley, Heidi. 2011. Compounding in distributed morphology, *The Oxford Handbook of Compounding*, ed. by Rochelle Lieber and Pavol Štekauer, 129-144, Oxford: Oxford University Press.

Holmberg, Anders. 1999. Remarks on Holmberg's generalization. *Studia linguistica,* 53, 11-39.

Hosono, Mayumi. 2013. *Object shift in the scandinavian languages: Syntax, information structure, and intonation*. Utrecht: Landelijke Onderzoekschool Taalwetenschap Publications.

Inaba, Jiro. 2009. Toward a phase-based analysis of post-verbal sentential complements in German. *InterPhases: Phase-theoretic investigations of linguistic interfaces*, ed. by Kleanthes Grohmann, 263-282, Oxford University Press, Oxford.

Ito, Junko, and Armin Mester. 2012. Recursive prosodic phrasing in Japanese. In: Borowsky, Toni, Shigeto Kawahara, Mariko Sugahara, and Takahito Shinya, eds. 2012. *Prosody matters. Essays in honor of Elisabeth Selkirk.* Advances in Optimality Theory Series. Elsevier. 280-303.

Kayne, Richard S. 1994. *The antisymmetry of syntax*. Cambridge, MA: MIT Press.

Kayne, Richard S. 2011. Why are there no directionality parameters?. *Proceedings of the 28th west coast conference on formal linguistics*. Somerville: Cascadilla Press. 1–23.

Moro, Andrea 2000. *Dynamic antisymmetry*. Cambridge, MA: MIT Press.

Nasukawa, Kuniya. 2011. Representing phonology without precedence relations. *English linguistics* 28, 278-300.

Nespor, Marina, Maria Teresa Guasti, and Anne Christophe. 1996. Selecting word order: The rhythmic activation principle. *Interfaces in phonology*, ed. by Ursula Kleinhenz, 1-26, Akademie Verlag, Berlin.

Newmeyer, Frederick J. 2005. *Possible and probable languages: A generative perspective on linguistic typology*. Oxford: Oxford University Press.

Richards, Norvin. 2010. *Uttering trees*. Cambridge, MA: MIT Press.

Richards, Norvin. 2014. *Contiguity theory*, ms., MIT. Available at lingbuzz/002247.

Selkirk, Elisabeth. 2011. The syntax-phonology interface. In John Goldsmith, Jason Riggle and Alan Yu (eds.), *The handbook of phonological theory, 2nd ed.* Blackwell.

Shiobara, Kayono. 2010. *Derivational linearization at the syntax-prosody interface*, Hituzi Syobo.

Shiobara, Kayono. 2011. Significance of linear information in prosodically constrained syntax. *English linguistics* 28, 258-277.

Snyder, William. 2001. On the nature of syntactic variation: Evidence from complex predicates and complex word-formation. *Language* 77: 324-342.

Tokizaki, Hisao. 2008. *Syntactic structure and silence: A minimalist theory of syntax-phonology interface,* Hituzi Syobo, Tokyo.

Tokizaki, Hisao. 2010. The morpho-phonological nature of the generalized Final-Over-Final Constraint. Paper presented at a themed session 'Disharmony in nominals' in LAGB Annual Meeting, University of Leeds, 2nd Sept 2010.

Tokizaki, Hisao. 2011a. Universal syntax and parametric phonology. Paper presented at the twenty-ninth conference of the English linguistic society of Japan, Niigata University.

Tokizaki, Hisao. 2011b. The nature of linear information in the mophosyntax-PF interface. *English linguistics* 28, 227–257.

Tokizaki, Hisao. 2013. Deriving the compounding parameter from phonology. *Linguistic analysis* 38, 275-303.

Tokizaki, Hisao and Yasutomo Kuwana. 2013a. Unattested word orders and left-branching structure. *Challenge to linearization,* ed. by Theresa Biberauer and Ian Roberts, 211-234, Mouton de Gruyter, Berlin.

Tokizaki, Hisao and Yasutomo Kuwana 2013b. A stress-based theory of disharmonic word orders. *Theoretical approaches to disharmonic word orders* ed. by Theresa Biberauer and Michelle Sheehan,* 190-215, Oxford University Press, Oxford.

Tokizaki, Hisao and Yoshihito Dobashi. 2013. Introduction to universal syntax and parametric phonology. *Linguistic analysis* 38, 147-151.

Willimas, Edwin S. 1982. The NP cycle. *Linguistic Inquiry* 13, 277-295.