

Logo



Movement

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Introduction

Movement is an operation that was introduced by transformational theories of generative grammar to characterize so-called displacement phenomena, as seen in *wh*-questions like “*Who* will Mary kiss ___?”, passive sentences like “*John* was kissed ___ (by Mary).”, and subject-aux inversion sentences like “*Will* Mary ___ kiss John?”. These constructions share an interesting property: the constituents at the beginning of these sentences are “displaced” from their original positions indicated by “___”, while the basic thematic relations between constituents (e.g., who did what to whom) remain the same. The long-distance dependencies formed by movement operations are of broad interest to linguistic theories; they not only constitute one of the most distinctive properties of natural language, but also provide a window into more general architectural constraints of the language faculty. The distribution of movement operations has been instrumental in advancing our understanding of fundamental grammatical concepts, such as case, theta roles, information structure, the argument/adjunct distinction, and perhaps most notably, locality constraints on grammatical operations. In the early 21st century, work on this topic has had broader impacts on psycholinguistics and child language research and has shed light on mechanisms of sentence processing and language acquisition.

Foundational Works

In order to account for the range of possible sentences in human language, the seminal works Chomsky 1955 and Chomsky 1957 proposed two classes of rules, namely, phrase structure rules that combine two constituents to create phrase markers and transformation rules that map one phrase marker to another. Some of these transformational operations included what became known as movement operations in later works, such as affix hopping (e.g., “Mary ___ kiss-*ed* John.”), passivization (e.g., “*John* was kissed ___ (by Mary).”), and subject-aux inversion (e.g., “*Will* Mary ___ kiss John?”) (see Types of Movement Operations). These construction-specific rules were later replaced by a single general movement rule in Chomsky 1981, and subsequent works Chomsky 1995 and Chomsky 2001 treated movement as a feature-checking operation that eliminates uninterpretable features that cannot be interpreted at the interfaces with the auditory-perceptual system or the conceptual-intentional system. Since Ross 1967 identified “islands,” i.e., the structural environments that prohibit certain transformation operations, subsequent works Chomsky 1973, Chomsky 1977, Chomsky 1986, and Rizzi 1990 (cited under Constraints on Movement: Relativized Minimality) attempted to provide a unifying explanation for the island constraints (see Constraints on Movement).

Chomsky, N. 1955. The logical structure of linguistic theory. PhD diss., Univ. of Pennsylvania.

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This is a published version of Noam Chomsky’s PhD dissertation that lays out the foundational concepts and approaches to the study of language cognition.

Find this resource:

Chomsky, N. 1957. *Syntactic structures*. Berlin: de Gruyter.

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This book is based on course lectures that Chomsky taught at MIT. This is a shorter and more accessible version of *The logical structure of linguistic theory*.

Find this resource:

Chomsky, N. 1973. Conditions on transformations. In *A Festschrift for Morris Halle*. Edited by S. Anderson and P. Kiparsky, 232–286. New York: Holt, Rinehart & Winston.

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This work proposed that Ross's island constraints can be subsumed under a more general Subjacency condition, which prohibits movement that crosses two bounding nodes that are considered to be S (IP) and NP.

Find this resource:

Chomsky, N. 1977. On wh-movement. In *Formal syntax*. Edited by P. Culicover, T. Wasow, and A. Akmajian, 71–132. New York: Academic Press.

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A seminal work that shows common features of A-bar movement, and lends further support to the view that all (overt) movements are bounded and respect Subjacency.

Find this resource:

Chomsky, N. 1981. *Lectures on government and binding*. Dordrecht, The Netherlands: Foris.

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Before this work, separate movement rules were proposed for different types of target constituents (e.g., Move-NP, Move-Wh) in order to capture their unique properties. However, Chomsky proposed to unify these separate operations as a single operation called Move α , which applies to any syntactic element to move it anywhere in the structure. Whether each movement is grammatical or not is determined by independently motivated principles (e.g., Case Theory).

Find this resource:

Chomsky, N. 1986. *Barriers*. Cambridge, MA: MIT Press.

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This book proposes a novel explanation of bounding nodes; it is argued that bounding nodes are not fixed representational units, but rather can be derivationally created in the course of syntactic computation.

Oxford Index

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Chomsky, N. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.

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This work presents an extensive study of the derivational model of transformational syntax, in which movement operations are driven by the requirement to check formal features that would otherwise be uninterpretable at the PF or LF interfaces.

Find this resource:

Chomsky, N. 2001. Derivation by phase. In *Ken Hale: A life in language*. Edited by M. Kenstowicz, 1–52. Cambridge, MA: MIT Press.

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This paper discusses in detail how syntactic derivation proceeds in a series of smaller computational domains called phases. The phase system resembles some of the core features of barriers in Chomsky 1986.

Find this resource:

Ross, J. 1967. Constraints on variables in syntax. PhD diss., Massachusetts Institute of Technology.

Save Citation » Export Citation » E-mail Citation »

The first extensive study on the constraints on movement operations and variables in transformation rules. This work inspired subsequent works on many major topics on movement, such as island constraints, pied piping, resumption, rightward movement, and scrambling.

Find this resource:

Textbooks

Given the central role that movement phenomena have played in syntactic theories, many standard textbooks on syntax provide a comprehensive review of data and analyses relating to movement. Van Riemsdijk and Williams 1986 provides an excellent review of how the analyses of movement have evolved since the inception of generative linguistics. Lasnik 2000 presents a similar historical review that focuses on head movement (see Types of Movement Operations: Head Movement). Davies and Dubinsky 2004 aims to teach syntactic argumentation through a historical review of raising and control phenomena (see Types of Movement Operations: A-Movement and Types of Movement Operations: Anaphoric Relations as Movement Dependencies). Lasnik and Uriagereka 1988 discusses the development of the Government and Binding framework with a special attention to movement phenomena. Freidin 1992 has a detailed chapter on movement, cyclicity, and the interaction of binding theory and movement operations. Hornstein, et al. 2005 is a textbook on minimalist syntax, and contains informative chapters on feature-checking theory of movement and Minimality constraints. Haegemann 1994 is the most accessible and comprehensive textbook on the Government and Binding framework, which remains essential for understanding the more recent Minimalist Program.

Davies, W. D., and S. Dubinsky. 2004. *The grammar of raising and control: A course in syntactic argumentation*. Illustrated ed. Malden, MA: Blackwell.

DOI: 10.1002/9780470755693 Save Citation » Export Citation » E-mail Citation »

A unique textbook that teaches syntactic argumentation and theory testing through a historical review of how the analysis of raising and control evolved over time.

Find this resource:

Freidin, R. 1992. *Foundations of generative syntax*. Cambridge, MA: MIT Press.

Save Citation » Export Citation » E-mail Citation »

The focus of the textbook is how to construct an argument in generative transformational grammar in Principles and Parameters framework. This textbook contains chapters on wh-movement and very detailed discussion on strict cycle condition and the interaction of movement and binding theory.

Find this resource:

Haegemann, L. 1994. *Introduction to government and binding theory*. 2d ed. Oxford: Blackwell.

Save Citation » Export Citation » E-mail Citation »

Haegemann has chapters for each type of movement rules (NP-movement, wh-movement, and head movement), as well as a concise introduction to the Barriers framework and Relativized Minimality (RM).

Find this resource:

Hornstein, N., J. Nunes, and K. K. Grohmann. 2005. *Understanding minimalism*. Cambridge, UK: Cambridge Univ. Press.

DOI: 10.1017/CBO9780511840678 Save Citation » Export Citation » E-mail Citation »

An excellent introduction to the minimalist framework of syntax, including the treatment of movement as a feature-driven operation. Familiarity with the Government and Binding framework is assumed.

Find this resource:

Lasnik, H., M. A. Depiante, and A. Stepanov. 2000. *Syntactic structures revisited: Contemporary lectures on classic transformational theory*. Cambridge, MA: MIT Press.

Save Citation » Export Citation » E-mail Citation »

This book discusses the classic ideas and analyses introduced in *Syntactic structures* (Chomsky 1957, cited under Foundational Works), with a special focus on analyses of affix-hopping transformation.

Find this resource:

Lasnik, H., and J. Uriagereka. 1988. *A course in GB syntax: Lectures on binding and empty categories*. Cambridge, MA: MIT Press.

Save Citation » Export Citation » E-mail Citation »

This book, based on courses that Howard Lasnik taught at the University of Connecticut, provides a detailed discussion of the development of the Government and Binding framework. Chapter 4, on the Empty Category Principle, is particularly useful.

Find this resource:

Van Riemsdijk, H. C., and E. Williams. 1986. *Introduction to the theory of grammar*. Cambridge, MA: MIT Press.

Save Citation » Export Citation » E-mail Citation »

A comprehensive review of the development of the generative grammar from the Standard Theory to the Government and Binding framework. Many of the chapters discuss various aspects of movement.

Find this resource:

Edited Collections

There are many edited collections that provide advanced overviews and discussions on more specific issues in syntax of movement. Baltin and Collins 2001 as well as Everaert, et al. 2006 includes summary articles on various types of movement operations. Cheng and Corver 2006 and Culicover and Postal 2001 contain many influential papers on A-bar movement (see Types of Movement Operations: A-Bar Movement) and parasitic gaps (see Types of Movement Operations: Sideward Movement), and Lightfoot and Hornstein 1994 remains one of the most important collections of papers on head movement. Corver and Nunes 2007 and Davies and Dubinsky 2008 focus on issues on movement that became popular under the minimalist framework, such as copy theory of movement or movement analysis of anaphoric relations (see Types of Movement Operations: Anaphoric Relations as Movement Dependencies).

Baltin, M. R., and C. Collins, eds. 2001. *The handbook of contemporary syntactic theory*. Oxford: Blackwell.

DOI: 10.1002/9780470756416 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This book contains surveys of various syntactic phenomena, with section 2 devoted to different types of movement phenomena.

Find this resource:

Cheng, L. L. S., and N. Corver, eds. 2006. *Wh-movement: Moving on*. Cambridge, MA: MIT Press.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

A collection of papers presented at a workshop that celebrated the twenty-fifth anniversary of the publication of Chomsky's seminal paper *On wh-movement*. The articles in this volume are devoted to aspects of wh-movement and related operations.

Find this resource:

Corver, N., and J. Nunes, eds. 2007. *The copy theory of movement*. Amsterdam: John Benjamins.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

Papers in this volume discuss the nature and consequences of the copy theory of movement proposed in Chomsky 1995 (cited under Foundational Works), with a special focus on the mapping between syntax and phonology.

Find this resource:

Culicover, P. W., and P. M. Postal, eds. 2001. *Parasitic gaps*. Cambridge, MA: MIT Press.

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This volume contains a number of important papers on parasitic gaps. The editor's introduction presents a valuable historical survey of parasitic gaps. This volume also includes a reprint of some of the classic papers (e.g., by Engdahl) on this topic.

Find this resource:

Davies, W. D., and S. Dubinsky, eds. 2008. *New horizons in the analysis of control and raising*. Dordrecht, The Netherlands: Springer.

Save Citation » Export Citation » E-mail Citation »

This is a collection of studies on raising and control constructions, with a special attention to whether control can be captured in terms of movement operations. The editors' introduction provides a valuable survey of theoretical and empirical issues on raising and control.

Find this resource:

Everaert, M., H. C. van Riemsdijk, R. Goedemans, and B. Hollebrandse, eds. 2006. *The Blackwell companion to syntax*. Oxford: Blackwell.

DOI: 10.1002/9780470996591 Save Citation » Export Citation » E-mail Citation »

This is an extensive collection of the articles on main topics in syntax. This collection contains survey articles on most types of movement phenomena.

Find this resource:

Lightfoot, D., and N. Hornstein, eds. 1994. *Verb movement*. Cambridge, UK, and New York: Cambridge Univ. Press.

DOI: 10.1017/CBO9780511627705 Save Citation » Export Citation » E-mail Citation »

This volume contains important cross-linguistic works on verb movement.

Find this resource:

Types of Movement Operations

While movement operations were unified in Chomsky 1981 (cited under Foundational Works) as a single operation that applies to any constituent, different applications of this movement operation as well as the traces left by the movement operations were subject to different licensing conditions. Much research has investigated the nature of these licensing conditions across languages, and these attempts have shed light on the nature of other grammatical requirements that drive movement, such as case, scope, morphology, and information structure.

HEAD MOVEMENT

Head movement refers to a movement operation that adjoins the head of a projection to that of another projection. This movement process is widely attested in verb/auxiliary movement (e.g., subject-aux inversion as in “*Will* Mary __ kiss John?”) or complex word formation processes across languages. It shows unique properties such as extreme locality and targeting a non-commanding position (e.g., Pollock 1989, Travis 1984), but Baker 1988 and Lema and Rivero 1990 argued that the relevant locality constraints can be unified with those that apply to other movement processes, such as the Empty Category Principle and Relativized Minimality (see Constraints on Movement). On the other hand, the unique properties have also led some to suggest alternative analyses that eliminate head movement from the inventory of syntactic operations (e.g., Chomsky 2001, cited under Foundational Works; Koopman and Szabolcsi 2000). Boeckx and Stjepanovic 2001, Matushansky 2006, and Roberts 2010 discuss the conceptual and empirical advantages and disadvantages of retaining head movement as a syntactic operation.

Baker, M. C. 1988. *Incorporation: A theory of grammatical function changing*. Chicago: Univ. of Chicago Press.

Save Citation » Export Citation » E-mail Citation »

This book presents an extensive cross-linguistic survey of grammatical function changing operations that Baker terms incorporation. He analyzes a variety of incorporation constructions and argues that they all involve head movement of one lexical

category to another (e.g., N-to-V, P-to-V, V-to-V), and further argues that Travis's head movement constraint can be subsumed under a more general condition on traces, namely, the ECP.

Find this resource:

Boeckx, C., and S. Stjepanovic. 2001. Head-ing toward PF. *Linguistic Inquiry* 32.2: 345–355.

DOI: 10.1162/00243890152001799 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper uses data from pseudogapping in English (e.g., “John ate the chocolate, but Mary did the cookies.”) to lend support to the suggestion in Chomsky 2001 (cited under Foundational Works) that head movement takes place after syntactic operations. Available online for purchase or by subscription.

Find this resource:

Koopman, H. J., and A. Szabolcsi. 2000. *Verbal complexes*. Cambridge, MA: MIT Press.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

Based on a comprehensive survey of restructuring constructions in Hungarian, Dutch, and German, this book argues that head movement does not exist as a grammatical operation, and the cases that have been analyzed as involving head movement all result from remnant movement of VP.

Find this resource:

Lema, J., and M. Rivero. 1990. Long head movement: ECP vs. HMC. In *Proceedings of the North East Linguistics Society 20*. Edited by J. Carter, 333–347. Amherst, MA: GLSA.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper discusses long head movement phenomena where a verb raises to a structural position higher than an auxiliary that dominates the verb. It is argued that this data challenges Travis's head movement constraint while it can be accommodated under the ECP account of the locality of head movement.

Find this resource:

Matushansky, O. 2006. Head movement in linguistic theory. *Linguistic Inquiry* 37.1: 69–109.

DOI: 10.1162/002438906775321184 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper analyzes head movement as a composite operation that consists of syntactic movement and morphological merger process, and argues that this view of head movement is compliant with the standard requirements on movement operations in syntax (contra the suggestion made in Chomsky 2001 (cited under Foundational Works)).

Find this resource:

Pollock, J.-Y. 1989. Verb movement, universal grammar, and the structure of IP. *Linguistic Inquiry* 20.3: 365–424.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper discusses the distribution of verb movement in French and argues that the projection that had been formerly treated as IP consists of two separate maximal projections, namely, AgrP and TenseP. Available online for purchase or by subscription.

Find this resource:

Roberts, I. G. 2010. *Agreement and head movement: Clitics, incorporation, and defective goals*. Cambridge, MA: MIT Press.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This monograph argues that head movement is a movement operation in syntax that applies where the Goal of an Agree relation is defective. This view is supported by data from Romance clitics and semantic effects of verb movement.

Find this resource:

Travis, L. M. 1984. *Parameters and effects of word order variation*. PhD diss., Massachusetts Institute of Technology.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This thesis presents a detailed investigation of head movement in Germanic languages, and proposes the head movement constraint, which prohibits head movement that skips an intervening head.

Find this resource:

A-MOVEMENT

One of the major discoveries in the Government and Binding framework was that raising (e.g., raising-to-subject, as in “*John* seems to Mary __ to be smart.”; raising-to-object, as in “Mary expects *John* __ to be smart.”), passive (“*John* was kissed __ (by Mary).”), and unaccusative (e.g., “*John* arrived __.”) constructions, among others, do not need to be treated as separate constructions, as they all show the same property of (a) moving from a thematic non-Case position to a non-thematic Case position, and (b) respecting the same licensing conditions on their traces, namely, traces are bound by their antecedents within a local domain, much like reflexives. These movement operations became known as A(argument)-movement. Baker, et al. 1989 presents one of the most influential analyses of passive construction, namely, that the passive morpheme itself serves as an external argument of the passive participle. The seminal work Perlmutter 1978 presents the Unaccusative Hypothesis that the subject of the unaccusative verb originates in the object position, and based on this hypothesis, Burzio 1986 as well as Levin and Rappaport-Hovav 1995 further explores the relation between syntax and verb semantics. Postal 1974 presents numerous arguments for the analysis that the so-called raising-to-object construction actually involves raising, and Lasnik and Saito 1991 presents further empirical arguments for Postal’s position. In fact, works after Postal 1974 argued that object raising is much more widely available than traditionally assumed; for example, both Johnson 1991 and Koizumi 1995 argued that object raising occurs in simple transitive structures, and Larson 1988 argued that object raising occurs in double object construction.

Baker, M., K. Johnson, and I. Roberts. 1989. *Passive arguments raised*. *Linguistic Inquiry* 20.2: 219–251.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper argues that the passive morpheme (*-en*) is a clitic that serves as an external argument of the passive participle. This external theta role is transmitted to the DP inside the *by*-phrase via a non-movement chain, which is also seen in Romance clitic doubling constructions. Available online for purchase or by subscription.

Find this resource:

Burzio, L. 1986. *Italian syntax: A government-binding approach*. Dordrecht, The Netherlands: Springer.

DOI: 10.1007/978-94-009-4522-7 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This work is best known for what has become known as Burzio’s Generalization that there is a correlation between the failure of assignment of a theta role to subject position and the failure of assignment of accusative Case.

Find this resource:

Johnson, K. 1991. Object positions. *Natural Language & Linguistic Theory* 9:577–636.

DOI: 10.1007/BF00134751 Save Citation » Export Citation » E-mail Citation »

Based on investigations of the double object construction, verb-particle construction, and other syntactic phenomena within VP, Johnson argues that the object NP undergoes overt A-movement to the specifier position of VP or of a higher functional projection. Available online for purchase or by subscription.

Find this resource:

Koizumi, M. 1995. Phrase structure in minimalist syntax. PhD diss., Massachusetts Institute of Technology.

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In this dissertation, Koizumi argues for a phrase structure representation that incorporates the Agreement Phrase (AgrP). Under AgrP analysis, Koizumi argues that English object NP undergoes A-movement from the complement of V position to the specifier position of AgrP.

Find this resource:

Larson, R. K. 1988. On the double object construction. *Linguistic Inquiry* 19:335–391.

Save Citation » Export Citation » E-mail Citation »

In this very influential paper, Larson argues that (a) VP has multiple layers (so-called VP-shell), and (b) a double object construction is derived via an A-movement of the indirect object across these VP layers.

Find this resource:

Lasnik, H., and M. Saito. 1991. On the subject of infinitives. In *CLS 27: Papers from the 27th regional meeting of the Chicago Linguistic Society*. Edited by L. M. Dorbin, L. Nichols, and R. M. Rodrigues, 324–343. Chicago: Chicago Linguistics Society.

Save Citation » Export Citation » E-mail Citation »

This work provides additional evidence for the raising-to-object rule that Postal 1974 defended.

Find this resource:

Levin, B., and M. Rappaport-Hovav. 1995. *Unaccusativity: At the syntax-lexical semantics interface*. Cambridge, MA: MIT Press.

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This monograph presents an extensive study of the mapping between verb semantics and syntactic structure, and lends support to Perlmutter's Unaccusativity Hypothesis that unaccusativity is syntactically represented but semantically determined.

Find this resource:

Perlmutter, D. 1978. Impersonal passives and the unaccusative hypothesis. In *Proceedings of the fourth annual meeting of the Berkeley Linguistics Society*, 157–190. Berkeley: Univ. of California Press.

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This seminal work introduced the concept that intransitive verbs can be classified as either unergative or unaccusative, and that these two types of intransitive verbs are each associated with a different underlying structure: unergative verb takes a D-Structure subject and no object, but an unaccusative verb takes no D-Structure subject but takes a D-Structure object, which raises to the subject position at S-Structure.

Find this resource:

Postal, P. M. 1974. *On raising: An inquiry into one rule of English grammar and its theoretical implications*. Cambridge, MA: MIT Press.

Save Citation » Export Citation » E-mail Citation »

This is a rigorous investigation that makes numerous empirical arguments for the existence of raising-to-object rule that raises a subject NP of an embedded clause to an object position in a higher clause.

Find this resource:

VP-INTERNAL SUBJECT HYPOTHESIS

In the early days of generative syntax, the subject NP was considered to be base-generated in the specifier position of Infl. In the 1980s and 1990s, however, many researchers argued that the subject NP originates in a VP-internal position and undergoes A-movement to the specifier of a higher functional projection. There have been both theoretical and empirical arguments for this position. Theoretically, if the subject originates in the VP, assignment of thematic roles (e.g., Agent, Patient, etc.) to both internal and external arguments can apply locally within the VP projection. Fukui 1995 and Kuroda 1988 make such theoretical arguments for VP-internal subjects. Empirically, it has been argued that the trace of subject NP exists in a VP-internal position based on binding reconstruction effects (Huang 1993), floating quantifiers (Koopman and Sportiche 1991), VP ellipsis (Kitagawa 1986), and post-verbal subjects in Romance languages (Zagona 1982). McCloskey 1997 provides an excellent survey of this domain of research.

Fukui, N. 1995. *Theory of projection in syntax*. Stanford, CA: CSLI.

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In this book, Fukui proposes that the phrase structure system is divided into two components, Lexical and Functional, and that thematic relations are specified in the lexical projection. He discusses various consequences of this proposal, and in this context, Fukui argues that the subject should originate in the specifier of the lexical projection, such as VP. Fukui argues that this system significantly simplifies the system of how thematic roles are assigned.

Find this resource:

Huang, C.-T. J. 1993. Reconstruction and the structure of VP: Some theoretical consequences. *Linguistic Inquiry* 24:103–138.

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Huang discusses interpretation of reflexive pronouns that are contained in fronted wh-phrases, and documents an asymmetry in binding reconstruction effects between predicate wh-fronting and argument wh-fronting. He argues that this asymmetry follows from the VP-internal Subject Hypothesis, i.e., the trace of the subject NP in the specifier of the predicate phrase determines the binding domain of the fronted reflexive. Available online for purchase or by subscription.

Find this resource:

Kitagawa, Y. 1986. Subjects in Japanese and English. PhD diss., Univ. of Massachusetts at Amherst.

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Through a detailed comparison of Japanese and English VP ellipsis, Kitagawa argues for the VP-internal Subject Hypothesis by showing that the trace of the subject NP in [Spec, VP] serves as an antecedent for the anaphor in the VP.

Find this resource:

Koopman, H., and D. D. Sportiche. 1991. The position of subjects. *Lingua* 85:211–258.

DOI: 10.1016/0024-3841(91)90022-W Save Citation » Export Citation » E-mail Citation »

Koopman and Sportiche present one of the most convincing empirical arguments for the VP-internal Subject Hypothesis, which is that a quantifier associated with the subject NP can appear around [Spec, VP]. They argue that this follows straightforwardly if (a) the subject NP and its quantifier are introduced together into [Spec, VP], and (b) the subject NP subsequently raises to a higher functional projection, stranding the quantifier behind. Available online for purchase or by subscription.

Find this resource:

Kuroda, S.-Y. 1988. Whether we agree or not: A comparative syntax of English and Japanese. In *Papers from the Second International Workshop on Japanese Syntax*. Edited by W. J. Poser, 103–143. Stanford, CA: CSLI.

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Kuroda argues that English is a forced agreement language while Japanese is not, and that from this difference derive many of the syntactic differences between these two languages. In this context, Kuroda presents various theoretical arguments for the VP-internal Subject Hypothesis.

Find this resource:

McCloskey, J. 1997. Subjecthood and subject positions. In *Elements of grammar: Handbook in generative syntax*. Edited by L. Haegeman, 197–235. Dordrecht, The Netherlands: Kluwer.

DOI: 10.1007/978-94-011-5420-8 Save Citation » Export Citation » E-mail Citation »

This paper summarizes the syntax of subjects in generative grammar. McCloskey offers a very detailed survey of theoretical and empirical issues relating to the VP-internal Subject Hypothesis.

Find this resource:

Zagona, K. T. 1982. Government and proper government of verbal projections. PhD diss., Univ. of Washington at Seattle.

Save Citation » Export Citation » E-mail Citation »

This is probably the first work that proposed the VP-internal Subject Hypothesis. Zagona argues that the behavior of the post-verbal subject construction in Romance languages can be explained straightforwardly if we assume that the subject NP can stay in [Spec, VP] while V overtly raises to a higher projection.

Find this resource:

A-BAR MOVEMENT

Movement operations that target non-argument positions are called A-bar movement. The major development in theoretical understanding of A-bar movement owes much to Chomsky 1977 (cited under Foundational Works), which showed that constructions that used to be analyzed as involving construction-specific rules (such as wh-questions “*Who* will Mary kiss ___?”, topicalization constructions “*That guy*, Mary will not kiss ___.”, relative clauses “*the guy* that Mary kissed ___”, clefts “It was *John* that Mary kissed ___.”) all share the same property of targeting the specifier of Complementizer Phrase (CP) and respecting island constraints (see Constraints on Movement). This work contributed to elimination of construction-specific rules in grammar and inspired subsequent works to explore how A-bar movement is realized in different constructions (e.g., Alexiadou, et al. 2000 on relativization), the nature of licensing conditions for A-bar movement (Cinque 1990 on wh-movement and clitic left dislocation; Müller 1995 on scrambling), and what type of landing site is available for A-bar movement (Rizzi 1997 on the left periphery).

Alexiadou, A., P. Law, A. Meinunger, and C. Wilder, eds. 2000. *The syntax of relative clauses*. Amsterdam: John Benjamins.

Save Citation » Export Citation » E-mail Citation »

One construction that is widely agreed to involve A-bar movement is relative clauses, but the precise source and target positions of relativization remain controversial. This volume includes important cross-linguistic studies that discuss whether relative clauses involve a clausal adjunction to DP or a determiner complementation and raising of the relativized nominal. The introduction chapter provides an excellent review of theoretical and empirical issues in syntax of relative clauses.

Find this resource:

Cinque, G. 1990. *Types of A'-dependencies*. Cambridge, MA: MIT Press.

Save Citation » Export Citation » E-mail Citation »

This monograph presents detailed investigations of wh-movement and clitic left dislocation constructions in Italian, and discusses the role of referentiality in wh-movement that appears to escape from island constraints.

Find this resource:

Müller, G. 1995. *A-bar syntax: A study in movement types*. Berlin: de Gruyter.

DOI: 10.1515/9783110814286 Save Citation » Export Citation » E-mail Citation »

This book contains detailed studies on A-bar movement in German, and suggests an important generalization that a remnant (an XP out of which some other movement has already applied) cannot undergo a movement of the same kind as the original movement that made it a remnant.

Find this resource:

Rizzi, L. 1997. The fine structure of the left periphery. In *Elements of grammar: Handbook in generative syntax*. Edited by L. Haegeman, 281–337. Dordrecht, The Netherlands: Kluwer.

DOI: 10.1007/978-94-011-5420-8 Save Citation » Export Citation » E-mail Citation »

This work shows that the CP layer (or left periphery), which is commonly viewed as the target position for A-bar movement, actually contains multiple functional projections that relate to the information structural concepts, such as focus, topic, and force.

Find this resource:

CROSS-LINGUISTIC VARIATIONS IN OVERT WH-MOVEMENT

While early studies on *wh*-movement were based mostly on English data, researchers working under the Principles and Parameters framework extended the investigation to languages with *wh*-constructions that show non-English-like overt *wh*-movement. Primary cases include multiple *wh*-fronting languages, in which more than one *wh*-phrase can overtly move (Boeckx and Grohmann 2003, Bošković 2002, Richards 2001, Rudin 1988), and partial *wh*-movement (or *wh*-scope marking) languages, which use an overt *wh*-scope marker that indicates the scope for the actual *wh*-phrase that only moves to the edge of the clause where it originates (Dayal 1994; Lutz, et al. 2000; McDaniel 1989; Stepanov and Stateva 2006). Boeckx and Grohmann 2003 and Lutz, et al. 2000 are collections of papers on multiple *wh*-fronting and partial *wh*-movement, respectively. Earlier works like Rudin 1988, Dayal 1994, and McDaniel 1989 provided detailed descriptions of these constructions using the Government and Binding framework, while Bošković 2002, Richards 2001, and Stepanov and Stateva 2006 present alternative analyses of these constructions using the technology and constraints of the minimalist framework.

Boeckx, C., and K. K. Grohmann. 2003. *Multiple wh-fronting*. Amsterdam: John Benjamins.

Save Citation » Export Citation » E-mail Citation »

This edited volume includes a number of papers that investigate the behavior of multiple *wh*-fronting in a wide range of languages.

Find this resource:

Bošković, Ž. 2002. On multiple *wh*-fronting. *Linguistic Inquiry* 33.3: 351–383.

DOI: 10.1162/002438902760168536 Save Citation » Export Citation » E-mail Citation »

This paper shows that what has been analyzed as multiple *wh*-fronting is in fact a focus movement as it does not show all the behaviors that are attributed to typical *wh*-movement. It is thus argued that multiple *wh*-movement is not a true grammatical parameter that pertains to *wh*-movement. Available online by subscription.

Find this resource:

Dayal, V. S. 1994. Scope marking as indirect *wh*-dependency. *Natural Language Semantics* 2.2: 137–170.

DOI: 10.1007/BF01250401 Save Citation » Export Citation » E-mail Citation »

This paper reports data on Hindi *wh*-scope marking and proposes an indirect dependency approach to *wh*-scope marking, where the *wh*-scope marker and the actual *wh*-phrase are not syntactically related. Available online for purchase or by subscription.

Find this resource:

Lutz, U., G. Müller, and A. von Stechow, eds. 2000. *Wh-scope marking*. Amsterdam: John Benjamins.

Save Citation » Export Citation » E-mail Citation »

This edited volume presents a comprehensive overview of the syntax and semantics of *wh*-scope marking. The introduction chapter provides a nice summary of the core empirical observations as well as three major classes of analyses (direct dependency, indirect dependency, or mixed approach).

Find this resource:

McDaniel, D. 1989. Partial and multiple *Wh*-movement. *Natural Language & Linguistic Theory* 7.4: 565–604.

DOI: 10.1007/BF00205158 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper argues for a direct dependency analysis of partial wh-movement in German and Romani, namely, that the lower wh-phrase is syntactically related to the wh-scope marker. Available online for purchase or by subscription.

Find this resource:

Richards, N. 2001. *Movement in language: Interactions and architectures*. Oxford: Oxford Univ. Press.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This book provides a comprehensive analysis of a wide variety of movement operations across languages. It is argued that the derivational model of syntax proposed in Chomsky 1995 (cited under Foundational Works) can provide a natural account for properties of multiple wh-fronting as well as an amelioration of certain ungrammatical representations.

Find this resource:

Rudin, C. 1988. On multiple questions and multiple WH fronting. *Natural Language & Linguistic Theory* 6.4: 445–501.

DOI: 10.1007/BF00134489 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

The first comprehensive study of multiple wh-movement in Balkan and Slavic languages. It is argued that there are two classes of multiple wh-fronting languages: (a) all wh-phrases arrive at [Spec, CP] (Bulgarian, Romanian), and (b) only one of the wh-phrases lands in [Spec, CP] (Serbo-Croatian, Polish, and Czech). Available online for purchase or by subscription.

Find this resource:

Stepanov, A., and P. Stateva. 2006. Successive cyclicity as residual wh-scope marking. *Lingua* 116.12: 2107–2153.

DOI: 10.1016/j.lingua.2005.06.004 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper adopts a version of Dayal's 1994 analysis of wh-scope marking, and argues that clause internal wh-movement (as seen in wh-scope marking) shows the default property of wh-movement, and long-distance wh-movement as in English is made possible by a special incorporation of abstract wh-scope marker into the matrix verb. Available online for purchase or by subscription.

Find this resource:

QUANTIFIER RAISING (QR)

Research on quantifiers (e.g., *some*, *every*, numerals, etc.) and how their scope is determined has been one of the major topics in transformational grammar, especially since May 1977, which argued that quantifiers covertly raise to higher structural positions after S-Structure (i.e., the representation that mediates covert component and sound component of the grammar) and influence subsequent semantic interpretation. The syntactic properties of quantifiers and the evidence that we need a covert movement operation like QR constitute strong evidence that there is an interface level called Logical Form (LF) which provides all the structural ingredients for computing semantic interpretation. Subsequent works on QR provided useful insights on the relation between grammatical computation and interface levels, which received a surge of interest after the introduction of the Minimalist Program (Chomsky 1995, cited under Foundational Works), in which interface levels were treated as the only levels of linguistic representation. Aoun and Li 1993 extends the QR analysis in the dissertation May 1977 and presents a detailed investigation of quantifier interactions in English, Chinese, and Japanese. Based on analyses of quantifiers and Antecedent Contained Deletion (ACD) (see Antecedent Contained Deletion), Fox 2000 argues that the scope relation of quantifiers is constrained by general economy conditions. While these works basically assumed the existence of covert operations like QR, alternative analyses of QR have been proposed; Hornstein 1995 argues that QR is merely an instance of A-movement (see A-

Movement), and Reinhart 2006 presents a choice function analysis of quantifier interaction.

Aoun, J., and Y. A. Li. 1993. *Syntax of scope*. Cambridge, MA: MIT Press.

Save Citation » Export Citation » E-mail Citation »

This book presents a detailed investigation of interaction of quantifiers as well as interaction of quantifiers and wh-operators, drawing on data from English, Chinese, and Japanese.

Find this resource:

Fox, D. 2000. *Economy and semantic interpretation*. Cambridge, MA: MIT Press.

Save Citation » Export Citation » E-mail Citation »

Fox attempts to show that the scope relation of quantifiers is constrained by general economy considerations as outlined in Chomsky 1995 (cited under Foundational Works).

Find this resource:

Hornstein, N. 1995. *Logical form: From GB to minimalism*. Oxford: Blackwell.

Save Citation » Export Citation » E-mail Citation »

This book explores whether QR and other constraints on the LF can be derived from other independently necessary grammatical operations such as A-movement. The book also presents an excellent summary of research on Logical Form in the GB era and what kind of issues the findings raise for syntax research under the minimalist framework.

Find this resource:

May, R. 1977. *The grammar of quantification*. PhD diss., Massachusetts Institute of Technology.

Save Citation » Export Citation » E-mail Citation »

This thesis presents an extensive study of syntactic properties of quantifiers. It is one of the earliest attempts to outline the concept of LF as a level of representation in the grammar.

Find this resource:

Reinhart, T. 2006. *Interface strategies: Optimal and costly computations*. Cambridge, MA: MIT Press.

Save Citation » Export Citation » E-mail Citation »

This monograph presents a theory of grammar that uses interface strategies to repair imperfections of syntactic and semantic computation. Chapter 2 provides a choice function analysis of quantifier interaction that provides a superior empirical coverage to analyses that assume QR.

Find this resource:

ANTECEDENT CONTAINED DELETION

One of the most important arguments for the existence of Quantifier Raising (QR) comes from analyses of Antecedent Contained Deletion (ACD) constructions like "John read *every book* that Mary did ____", in which the elided VP (e.g., the VP after *did* in the

example) is contained in its antecedent on the surface representation (e.g., “read every book that Mary did”), and the elided VP yields the identical interpretation to its antecedent. This interpretation data creates a puzzle: if the interpretation is established by (as is standardly assumed) copying the antecedent into the elided VP, then that copy also contains an elided VP; this leads to an infinite regress of copying operations and should not be computable by the grammar. May 1985 argues that ACD constructions are grammatical and interpretable because the quantified NP that contains the VP ellipsis site undergoes QR and leaves a trace in the original position; thus, copying the antecedent to the ellipsis site only copies the trace of the quantified NP, such that the ellipsis site itself no longer exists in the copy. Baltin 1987 points out empirical problems with the theory of ACD relying on QR and proposes an alternative analysis that the relative clause that contains the elided VP is extraposed (see Rightward Movement). Hornstein 1994 and Lasnik 1999, on the other hand, point out that QR shows very similar properties to A-movement and argue that QR is just an instance of A-movement of the NP that contains the elided VP. Kennedy 1997 points out that the A-movement analyses cannot explain the behavior of NP-contained ACD and argues instead for the QR approach.

Baltin, M. 1987. Do antecedent-contained deletions exist? *Linguistic Inquiry* 18:579–595.

Save Citation » Export Citation » E-mail Citation »

Baltin observes the Boundedness Restriction on ACD, i.e., ACD in multiple wh-questions, can only be interpreted as identical to the local VP. He argues that the Boundedness Restriction follows straightforwardly if the ACD is resolved by means of extraposition of the relative clause containing the VP-ellipsis site. Available online for purchase or by subscription.

Find this resource:

Hornstein, N. 1994. An argument for minimalism: The case of antecedent-contained deletion. *Linguistic Inquiry* 25:455–480.

Save Citation » Export Citation » E-mail Citation »

Hornstein presents conceptual arguments for analyzing ACD as involving A-movement. For example, under the LF-pied piping theory of Chomsky 1995 (cited under Foundational Works), QR cannot move the relative clause together with a quantifier (i.e., the infinite regress problem is not solved), whereas A-movement can move the whole NP including the restrictor. Available online for purchase or by subscription.

Find this resource:

Kennedy, C. 1997. Antecedent-contained deletion and the syntax of quantification. *Linguistic Inquiry* 28:662–688.

Save Citation » Export Citation » E-mail Citation »

Kennedy points out empirical problems with the A-movement analysis of QR. Specifically, in NP-contained ACD constructions, in which the VP-ellipsis site is contained in the PP complement of a noun, a phrase inside an NP cannot be A-moved; thus, A-movement cannot be responsible for ACD resolution. Kennedy argues that the QR analysis can correctly capture the interpretation of NP-contained ACD.

Find this resource:

Lasnik, H. 1999. *Minimalist analysis*. Oxford: Basil Blackwell.

Save Citation » Export Citation » E-mail Citation »

This book discusses various aspects of the Minimalist Program proposed in Chomsky 1995 (cited under Foundational Works). Like Hornstein 1994, Lasnik argues against the QR analysis of ACD, and argues for an A-movement analysis of ACD.

Find this resource:

May, R. 1985. *Logical form: Its structure and derivation*. Cambridge, MA: MIT Press.

Save Citation » Export Citation » E-mail Citation »

This book argues for the covert component of grammar, LF, based on the syntax of quantifiers. May argues that in ACD constructions, QR moves the quantified NP (that contains the VP-ellipsis site) out of the scope of the antecedent of the ellipsis. As a result, the antecedent does not contain the ellipsis site, and this solves the infinite regress problem.

Find this resource:

WH-IN-SITU

Unlike in overt wh-movement languages like English, wh-phrases in languages like Chinese or Japanese are able to remain in the position in which they were base-generated. These so-called wh-in-situ languages have received much attention since Huang 1982 argued that despite appearances, wh-in-situ indeed shows properties of movement, moving covertly before the LF as in QR operations proposed in May 1977 (cited under Quantifier Raising (QR)). Subsequent works explored various ways to implement covert movement in grammar, as well as its consequences on the theory of islands. Nishigauchi 1990 extends the investigation to Japanese wh-in-situ, and argues that Japanese wh-in-situ respects island constraints based on interpretation data. Watanabe 1992 proposes an analytical alternative to the LF-movement presented in Huang 1982 and argues that in wh-in-situ languages, a phonologically null operator moves in overt syntax. Pesetsky 1987 and Reinhart 1998 argue for analyses that do not require any syntactic movement of in-situ wh-phrases. Cheng and Rooryck 2000 explores licensing conditions on wh-in-situ in French.

Cheng, L., and J. Rooryck. 2000. Licensing *Wh*-in-situ. *Syntax* 3.1: 1–19.

DOI: 10.1111/1467-9612.00022 Save Citation » Export Citation » E-mail Citation »

This paper explores the distribution of wh-in-situ in French and its interpretive possibilities, and argues that French wh-in-situ is licensed by an intonation morpheme that is also used to license polar questions. Available online for purchase or by subscription.

Find this resource:

Huang, C. T. 1982. *Logical relations in Chinese and the theory of grammar*. PhD diss., Massachusetts Institute of Technology.

Save Citation » Export Citation » E-mail Citation »

This dissertation provides the first extensive study on wh-in-situ constructions in Chinese and argues that wh-phrases undergo LF-movement after the S-Structure. Through a detailed analysis of wh-in-situ constructions, it is argued that Subjacency constraints affect operations before S-Structure, while the ECP holds at both S-Structure and LF. This is a strong argument for covert operations and the existence of LF as a level of linguistic representation.

Find this resource:

Nishigauchi, T. 1990. *Quantification in the theory of grammar*. Dordrecht, The Netherlands: Kluwer.

DOI: 10.1007/978-94-009-1972-3 Save Citation » Export Citation » E-mail Citation »

Nishigauchi argues that wh-in-situ, which appears as if it is not constrained by islands, actually respects islands, and shows that the apparent island immunity results from a clausal pied-piping of the entire island that contains an in-situ wh-phrase.

Find this resource:

Pesetsky, D. 1987. Wh-in-situ: Movement and unselective binding. In *The representation of (in)definiteness*. Edited by E. Reuland and A. G. B. ter Meulen, 98–129. Cambridge, MA: MIT Press.

Save Citation » Export Citation » E-mail Citation »

Through studies of syntactic behavior of wh-phrases in wh-in-situ languages and d(iscourse)-linked wh-phrases in overt wh-movement language, Pesetsky argues that d-linked wh-in-situ phrases do not undergo covert movement, but rather they are assigned scope by unselective binding.

Find this resource:

Reinhart, T. 1998. Wh-in-situ in the framework of the Minimalist Program. *Natural Language Semantics* 6.1: 29–56.

DOI: 10.1023/A:1008240014550 Save Citation » Export Citation » E-mail Citation »

This paper argues that interpretation of in-situ wh-phrases involves choice functions that are bound by the question operator, and that this analysis provides a natural account for why adverbial wh-in-situ is not licensed inside island domains. Available online for purchase or by subscription.

Find this resource:

Watanabe, A. 1992. Subjacency and S-structure movement of wh-in-situ. *Journal of East Asian Linguistics* 1:255–291.

DOI: 10.1007/BF00130554 Save Citation » Export Citation » E-mail Citation »

Through detailed analysis of wh-interrogatives, comparative deletion, and head-internal relative clauses in Japanese, this paper argues that all of these constructions involve overt movement of a phonologically null operator. Available online for purchase or by subscription.

Find this resource:

SCRAMBLING

Since the seminal work on movement Ross 1967 (cited under Foundational Works), it has been known that some languages have optional word order changing rules which Ross named scrambling. Two of the central topics in this domain are (a) whether optional movement operations such as scrambling are motivated by any feature like other types of movement (e.g., Mahajan 1990, Miyagawa 1997), and (b) whether these optional movements respect locality constraints like other movement operations (e.g., Saito 1985). One influential finding in Saito 1989 and Saito 1992 is that long-distance (A-bar) scrambling in Japanese does not form an operator-variable chain like other A-bar movement operations (e.g., wh-movement). This unique property of long-distance scrambling led to subsequent works like Bošković and Takahashi 1998 and Grewendorf and Sabel 1999, which tried to explain this phenomenon by using tools that became available in the minimalist framework.

Bošković, Ž., and D. Takahashi. 1998. Scrambling and last resort. *Linguistic Inquiry* 29:347–366.

DOI: 10.1162/002438998553789 Save Citation » Export Citation » E-mail Citation »

This paper argues that scrambling, which has been generally understood as an optional operation, is in fact a last-resort operation that is necessary for satisfying the theta criterion, i.e., all arguments must have a thematic role. They argue that the scrambled phrase is base-generated in the non-theta surface position, and obligatorily moves to check its uninterpretable theta

feature (i.e., a thematic role) before reaching LF. Available online for purchase or by subscription.

Find this resource:

Grewendorf, G., and J. Sabel. 1999. Scrambling in German and Japanese: Adjunction versus multiple specifiers. *Natural Language & Linguistic Theory* 17.1: 1–65.

DOI: 10.1023/A:1006068326583 Save Citation » Export Citation » E-mail Citation »

Through a comparative analysis of scrambling in German and Japanese, this paper argues that clause-internal scrambling shows A-movement properties in Japanese and A-bar movement properties in German, while long-distance scrambling (which is not possible in German) only shows A-bar movement properties. These differences are attributed to the availability of multiple specifiers in Japanese Agreement projections. Available online for purchase or by subscription.

Find this resource:

Mahajan, A. K. 1990. The A/A-bar distinction and movement theory. PhD diss., Massachusetts Institute of Technology.

Save Citation » Export Citation » E-mail Citation »

Through a detailed study of Hindi scrambling, this dissertation shows that clause-internal scrambling can be either A or A-bar movement, while long-distance scrambling is necessarily A-bar movement.

Find this resource:

Miyagawa, S. 1997. Against optional scrambling. *Linguistic Inquiry* 28:1–25.

Save Citation » Export Citation » E-mail Citation »

Miyagawa argues that scrambling, which is generally understood as optional movement, is actually not optional. He argues that scrambling is motivated by formal features (e.g., focus) that relate to information structure. Available online for purchase or by subscription.

Find this resource:

Saito, M. 1985. Some asymmetries in Japanese and their theoretical implications. PhD diss., Massachusetts Institute of Technology.

Save Citation » Export Citation » E-mail Citation »

In this dissertation, Saito shows that scrambling in Japanese demonstrates the same properties as overt wh-movement in English, e.g., both scrambling and wh-movement respect island constraints.

Find this resource:

Saito, M. 1989. Scrambling as semantically vacuous A'-movement. In *Alternative conceptions of phrase structure*. Edited by M. Baltin and A. Kroch, 182–200. Chicago: Univ. of Chicago Press.

Save Citation » Export Citation » E-mail Citation »

This paper argues that scrambling does not form an operator-variable chain (unlike wh-movement), and that the scrambled constituent is obligatorily reconstructed to its thematic position.

Find this resource:

Saito, M. 1992. Long distance scrambling in Japanese. *Journal of East Asian Linguistics* 1.1: 69–118.

DOI: 10.1007/BF00129574 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This article extensively studies the landing site of long-distance scrambling in Japanese. Available online for purchase or by subscription.

Find this resource:

OBJECT SHIFT IN SCANDINAVIAN LANGUAGE

Since Holmberg 1986, a study on object positions in Scandinavian languages, it has been known that objects in Scandinavian languages undergo a special type of movement called object shift. Holmberg 1986 observes that object shift correlates with verb movement, i.e., whenever object shift is observed, overt verb movement is also observed. This observation later became known as Holmberg's Generalization. Subsequent works investigated the nature of object shift as well as its broader implications for the theory of grammar. Bobaljik 1994 explores the restriction on object shift that it cannot occur in participle construction. Chomsky 1995 (cited under Foundational Works) argued based on Holmberg's Generalization that verb movement is a necessary condition for object movement in general and that verb movement extends the locality domain for object movement. Holmberg and Platzack 1995 investigates whether object shift is an instance of A-movement or A-bar movement, as well as what types of constituents undergo object shift. Vikner 1994 investigates the landing site of object shift.

Bobaljik, J. D. 1994. What does adjacency do. In *The morphology-syntax connection: Proceedings of the January 1994 MIT workshop*. Edited by H. Harley and C. Phillips, 1–32. MIT Working Papers in Linguistics 22. Cambridge, MA: MIT Press.

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Bobaljik investigates a restriction on object shift: it is prohibited in participle construction. He argues that this restriction follows from the adjacency requirement on the participle morphology, i.e., the participle and VP must be adjacent to each other. Object shift is prohibited in the participle construction because the shifted object lands between the participle phrase and VP, such that the adjacency requirement is violated.

Find this resource:

Holmberg, A. 1986. Word order and syntactic features. PhD diss., Stockholm.

Save Citation » [Export Citation »](#) [E-mail Citation »](#)

This dissertation investigated the object shift phenomenon in Scandinavian languages and established the generalization that object shift correlates with verb movement.

Find this resource:

Holmberg, A., and C. Platzack. 1995. *The role of inflection in Scandinavian syntax*. New York: Oxford Univ. Press.

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Building on Holmberg 1986, Holmberg and Platzack further investigate the nature of object shift as well as other syntactic phenomena in Scandinavian languages. Based on the observation that the shifted object does not bind the reflexive in an adjunct phrase, it is argued that object shift is not A-movement. They also found some cross-linguistic differences in what type of constituent undergoes object shift.

Find this resource:

Vikner, S. 1994. Scandinavian object shift and West Germanic scrambling. In *Studies on scrambling: Movement and non-movement approaches to free word-order phenomena*. Edited by N. Corver and H. van Riemsdijk, 487–518. Berlin: Mouton de Gruyter.

DOI: 10.1515/9783110857214 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper presents a detailed comparison between Scandinavian object shift and West Germanic scrambling. Based on the height difference between the shifted object relative to VP-modifying adverbs, Vikner suggests that the shifted object moves to a position higher than the host VP.

Find this resource:

SIDEWARD MOVEMENT

While it has been traditionally assumed that syntactic derivation creates only one root structure that gradually becomes larger, some researchers working under the minimalist framework explored whether discarding this assumption could give rise to conceptual and empirical virtues. As a result, a movement operation called sideward movement (also known as interarboreal operation) was proposed, which refers to an operation by which a constituent that is constructed independently of the root is later merged to the root. Bobaljik and Brown 1997 argues that if head movement is analyzed as involving this operation, it would no longer violate the Extension Condition, a requirement to extend the root by merging a constituent. Nunes 2004 provides a detailed theoretical discussion on why sideward movement should be allowed as a legitimate operation in grammar and further shows that sideward movement offers a natural explanation for the behavior of parasitic gap (e.g., “*Which paper* did John file ___ before Mary read ___?”) and across-the-board extraction (e.g., “*Which paper* did John file ___ and Mary read ___?”) constructions. Drummond 2011 extends sideward movement to analyses of binding phenomena.

Bobaljik, J., and S. Brown. 1997. Interarboreal operations: Head movement and the extension requirement. *Linguistic Inquiry* 28:345–356.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper argues that sideward movement would make head movement compatible with the Extension Condition, a requirement that movement operations extend the phrase marker by means of merging a constituent to the root node. Available online for purchase or by subscription.

Find this resource:

Drummond, A. 2011. Binding phenomena within a reductionist theory of grammatical dependencies. PhD diss., Univ. of Maryland, College Park.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

Drummond's thesis is an extension and revision of Hornstein's movement approach to construal. Using sideward movement, Drummond shows that Condition B effects of Binding Theory derive directly from an anti-locality constraint on A-movement.

Find this resource:

Nunes, J. 2004. *Linearization of chains and sideward movement*. Cambridge, MA: MIT Press.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

Nunes argues that the operation Move should be understood as the description of the interaction of Copy, Merge, Form Chain,

and Chain Reduction, and this proposal makes room for operations like sideward movement. He further shows that if sideward movement is a legitimate operation in the grammar, all the main properties of parasitic gap and across-the-board extraction constructions can be explained naturally.

Find this resource:

ANAPHORIC RELATIONS AS MOVEMENT DEPENDENCIES

While the similarity between anaphoric relations and movement dependencies was noted in the Government and Binding framework, construal processes such as binding and control were treated as different from movement operations whose unique role is to syntactically relate two syntactic positions. However, since the advent of a derivational model of transformational syntax in Chomsky 1995 (cited under Foundational Works) that abandons syntax-internal levels of representations, researchers have asked whether anaphoric relations could be established through structure-building operations like Merge and Move. Bowers 1973 presents one of the earliest analyses that treat control and raising alike in the transformational framework. Bresnan 1982 also treats control and raising alike using tools from the Lexical Functional Grammar framework. Hornstein 2001 as well as Lidz and Idsardi 1998 analyzes both control and reflexive binding as an instance of A-movement. Polinsky and Potsdam 2002 extends Movement Theory of Control (MTC) in Hornstein 2001 to the backward control construction in Tsez. On the other hand, Landau 2003 and Culicover and Jackendoff 2001 argue on empirical and conceptual grounds against the Movement Theory of Control in Hornstein 2001. Kayne 2002 argues that pronominal binding can be analyzed as involving movement. Hicks 2009 explores the consequences of the movement approach to reflexive binding. While the derivational theories of construal remain controversial, this line of research represents one of the most fruitful efforts in the minimalist framework to simplify the theory of grammatical operations and primitives.

Bowers, J. 1973. Grammatical relations. PhD diss., Massachusetts Institute of Technology.

Save Citation » Export Citation » E-mail Citation »

Bowers's dissertation is one of the earliest attempts to treat raising and control alike. Bowers discusses similarities and differences between control and raising constructions, and argues that these constructions have the same underlying derivation.

Find this resource:

Bresnan, J. 1982. Control and complementation. *Linguistic Inquiry* 13:343–434.

Save Citation » Export Citation » E-mail Citation »

This article offers a theory of control and raising under the Lexical Functional Grammar (LFG) framework, where both control and raising involve structure-sharing between the matrix subject and the subject of the embedded infinitival clause. The differences between these two constructions come from the lexical properties of the predicate. Thus, control and raising are analyzed as having the same structure, much like Movement Theory of Control. Available online for purchase or by subscription.

Find this resource:

Culicover, P. W., and R. Jackendoff. 2001. Control is not movement. *Linguistic Inquiry* 32:493–512.

DOI: 10.1162/002438901750372531 Save Citation » Export Citation » E-mail Citation »

Culicover and Jackendoff argue that Hornstein's 1999 Movement Theory of Control (Movement and control. *Linguistic Inquiry* 30.1: 69–96) does not explain the fact that control in nominals is possible while raising is not. They offer an argument that the control phenomenon should be understood as involving, at least in part, semantic operations. Available online for purchase or by subscription.

Find this resource:

Hicks, G. 2009. *The derivation of anaphoric relations*. Amsterdam: John Benjamins.

Save Citation » Export Citation » E-mail Citation »

This book further explores the movement theory of binding in a variety of Germanic languages, and offers explanations for issues that challenged derivational theories of anaphora, such as connectivity effects, exempt anaphors in English, and the noncomplementarity of anaphors and pronouns.

Find this resource:

Hornstein, N. 2001. *Move! A minimalist theory of construal*. Malden, MA: Wiley-Blackwell.

Save Citation » Export Citation » E-mail Citation »

In this book, Hornstein extends his earlier work on the Movement Theory of Control and argues that all construal processes could be reduced to movement operations.

Find this resource:

Kayne, R. S. 2002. Pronouns and their antecedents. In *Derivation and explanation in the minimalist program*. Edited by S. Epstein and T. D. Seely, 133–166. Malden, MA: Blackwell.

DOI: 10.1002/9780470755662 Save Citation » Export Citation » E-mail Citation »

This paper proposes a movement approach to pronominal coreference, namely, antecedent and pronoun are introduced together into the derivation as a doubling construction, and the antecedent subsequently moves to a higher position.

Find this resource:

Landau, I. 2003. Movement out of control. *Linguistic Inquiry* 34:471–498.

DOI: 10.1162/002438903322247560 Save Citation » Export Citation » E-mail Citation »

This article is a critique of Hornstein's 1999 Movement Theory of Control (Movement and control. *Linguistic Inquiry* 30.1: 69–96). Landau argues that the Movement Theory of Control (MTC) predicts the presence of structures and interpretations that do not exist in natural language, and that MTC does not explain certain interpretive possibilities in control constructions, such as partial control. Available online for purchase or by subscription.

Find this resource:

Lidz, J., and W. Idsardi. 1998. Chains and phono-logical form. *University of Pennsylvania Working Papers in Linguistics* 5.1: 109–125.

Save Citation » Export Citation » E-mail Citation »

Based on distributional analyses of NP-movement, control, and anaphor binding, this paper argues that these three constructions all involve a movement chain, and that NP-trace, PRO, and reflexives are allomorphs whose form is determined by the number of Cases and theta roles assigned to the chain.

Find this resource:

Polinsky, M., and E. Potsdam. 2002. Backward control. *Linguistic Inquiry* 33.2: 245–282.

DOI: 10.1162/002438902317406713 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper documents backward subject control in Tsez and argues that the Movement Theory of Control naturally predicts the presence of such backward control relations. Available online for purchase or by subscription.

Find this resource:

RIGHTWARD MOVEMENT

While most displacement phenomena suggest analyses in terms of “leftward movement,” in the sense that the landing site of movement linearly precedes the original position, there also exist phenomena such as extraposition (e.g., “A book __ appeared *which was written by Chomsky.*”) or heavy NP shift (e.g., “I gave __ to John *everything I had.*”) in which a constituent appears to the right of its canonical position, suggesting the possibility of rightward movement. See Baltin 1981 for a detailed exploration of the locality constraint on rightward movement, and Guéron and May 1984 for semantic rules that allow the interpretation of sentences with rightward movement. These constructions show some unique properties that are not observed in constructions conventionally analyzed via (leftward) movement (Ross 1967, cited under Foundational Works), and this observation has led some researchers to propose that they are not derived via syntactic movement at all (e.g., Culicover and Rochemont 1990, Kayne 1994). Fox and Nissenbaum 1999 argues that rightward movement applies to the complement of nouns but not to adjunct modifiers like relative clauses, while Drummond 2009 argues that extraposition of any finite clauses involves rightward movement. Beerman, et al. 1997 includes papers that report rightward movement data from a variety of languages, and Baltin 2005 presents an excellent survey of empirical and theoretical issues on extraposition.

Baltin, M. 1981. Strict bounding. In *The logical problem of language acquisition*. Edited by C. L. Baker and J. McCarthy, 257–295. Cambridge, MA: MIT Press.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper proposes the generalized Subjacency condition that provides a unified account for island constraints on leftward movement and what came to be known as right roof constraints on rightward movement.

Find this resource:

Baltin, M. 2005. Extraposition. In *The Blackwell companion to syntax*. Edited by M. Everaert, H. C. van Riemsdijk, R. Goedemans, and B. Hollebrandse, 237-271. Oxford: Blackwell.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This chapter provides an excellent summary of empirical observations and analyses of rightward movement.

Find this resource:

Beerman, D., D. LeBlanc, and H. C. van Riemsdijk, eds. 1997. *Rightward movement*. Amsterdam: John Benjamins.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This edited volume includes papers that report rightward movement data from a wide range of languages.

Find this resource:

Culicover, P. W., and M. S. Rochemont. 1990. Extraposition and the complement principle. *Linguistic Inquiry* 21.1: 23–47.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper offers a reformulation of the Complement Principle (Gueron and May 1984) and argues that the extraposed constituent is base-generated in a right-adjoined position without undergoing rightward movement. Available online for purchase or by subscription.

Find this resource:

Drummond, A. 2009. The unity of extraposition and the A/A-bar distinction. *Proceedings of the Annual Meeting of the Chicago Linguistics Society* 45.2: 43–56.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

Based on detailed investigations of Minimality effects in heavy NP shift, PP extraposition, and extraposition of finite clauses, Drummond defends the analysis of rightward movement as a grammatical operation in narrow syntax.

Find this resource:

Fox, D., and J. Nissenbaum. 1999. Extraposition and scope: A case for overt QR. In *Proceedings of the 18th West Coast Conference on Formal Linguistics*. Edited by S. Byrd, A. Carnie, J. Haugen, and P. Norquest, 132–144. Somerville, MA: Cascadilla.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper argues that extraposition of complements is derived by rightward movement, but extraposition of DP modifiers (such as relative clauses) is derived by a late insertion of adjuncts to a covertly raised DP.

Find this resource:

Guéron, J., and R. May. 1984. Extraposition and logical form. *Linguistic Inquiry* 15.1: 1–31.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper proposes an interpretation rule called the Complement Principle that applies at LF to semantically relate an extraposed constituent to its host. Available online for purchase or by subscription.

Find this resource:

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

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This monograph proposes the Linear Correspondence Axiom (LCA) that accounts for how hierarchical representations can be converted into a linearized structure. This account makes critical use of asymmetric c-command relations, and as a consequence, Kayne argues that right-adjunction operations such as rightward movement should be eliminated from the theory of grammar.

Find this resource:

Constraints on Movement

In the early stage of the development of movement rules, it became clear that movement rules are subject to various constraints. Originally, Chomsky 1964 argued that wh-movement is subject to the so-called A-over-A constraint, which states that the transformation does not target the category A that is dominated by the same category A. Ross 1967 (cited under Foundational Works) investigated the A-over-A constraint in a great detail and found that there are many constructions that violate the A-over-A constraint but are still grammatical, and there are many constructions that do not violate A-over-A constraint but are still ungrammatical. This led Ross to propose a set of island constraints that specify structural environments from which movement cannot occur. This work inspired numerous investigations of the nature of constraints on transformations as well as the extent to which these constraints apply across different languages. Szabolcsi and den Dikken 2003 provides a comprehensive summary of cross-linguistic data on strong and weak islands, and Boeckx 2008 provides an excellent historical overview of how theories of islands developed since the 1960s.

Boeckx, C. 2008. Islands. *Language and Linguistics Compass* 2.1: 151–167.

DOI: 10.1111/j.1749-818X.2007.00043.x [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This article presents a historical overview of how island constraints were discovered and analyzed in works subsequent to Ross 1967, cited under Foundational Works. Available online for purchase or by subscription.

Find this resource:

Chomsky, N. 1964. *Current issues in linguistic theory*. The Hague: Mouton de Gruyter.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This book introduced the notion that certain transformations result in ungrammaticality even if they meet the structural requirement for applying the transformations.

Find this resource:

Szabolcsi, A., and M. den Dikken. 2003. Islands. In *The second Glot international state-of-the article book: The latest in linguistics*. Edited by L. Cheng and R. Sybesma, 213–240. Berlin: Mouton de Gruyter.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper presents a detailed review of strong and weak island constraints across languages.

Find this resource:

SUBJACENCY AND SUBSEQUENT DEVELOPMENT OF THE THEORY OF ISLANDS

The discoveries of islands led researchers to ask whether several island constraints need to be stipulated in the theory of grammar as originally formulated in Ross 1967 (cited under Foundational Works). Chomsky's work in the 1970s focused on this question and proposed to subsume island constraints under more general constraints on transformations, such as Subjacency, which essentially prohibits movement that crosses two bounding categories (NP and IP) in one step (Chomsky 1973 and Chomsky 1977, both cited under Foundational Works). Boeckx 2008 is an advanced textbook that reviews the empirical and theoretical issues on the theory of islands. Boeckx and Grohmann 2007 provides critical discussions on the extent to which the phase-based system of Chomsky 2001 (cited under Foundational Works) can explain the locality constraints.

Boeckx, C. 2008. *Understanding minimalist syntax: Lessons from locality in long-distance dependencies*. Oxford: Blackwell.

Save Citation » Export Citation » E-mail Citation »

While this book is presented as a textbook on minimalist syntax, it focuses on a minimalist treatment of empirical and theoretical issues surrounding successive cyclicity.

Find this resource:

Boeckx, C., and K. K. Grohmann. 2007. Remark: Putting phases in perspective. *Syntax* 10.2: 204–222.

DOI: 10.1111/j.1467-9612.2007.00098.x Save Citation » Export Citation » E-mail Citation »

This article presents a review of the notion of phase that was introduced in the minimalist framework, and assesses the extent to which the phase-based model accounts for cyclicity and island constraints. Available online for purchase or by subscription.

Find this resource:

THE EMPTY CATEGORY PRINCIPLE AND CONDITION ON EXTRACTION DOMAINS

It was discovered in the 1970s that Subjacency or licensing conditions on traces of NP movement are not sufficient for accounting for subject-object asymmetry in *wh*-movement (e.g., *that*-t effect) or argument-adjunct asymmetry in *wh*-extraction. These observations led Chomsky 1981 (cited under Foundational Works) to propose the Empty Category Principle (ECP) as an identificational condition on traces. ECP states that traces must be properly governed, i.e., the trace must be either lexically/head-governed (i.e., the trace must be the complement of a lexical head, such as V, N, A, and P), or antecedent-governed (i.e., bound by a category that governs it) (but see Kayne 1983 for an alternative definition). This proposal had a significant impact on research on movement. First, it led to a number of important cross-linguistic findings on movement dependencies (Huang 1982, cited under Types of Movement Operations: *Wh*-In-Situ; Lasnik and Saito 1992). Second, what used to be considered as independent constraints on movement could be unified under the ECP; for example, Baker 1988 (cited under Types of Movement Operations: Head Movement) showed that head movement constraint could be derived from the ECP. Third, the ECP may shed light on Condition on Extraction Domains (CED; Huang 1982, cited under Types of Movement Operations: *Wh*-In-Situ), a generalization that movement out of non-lexically governed domains (i.e., subject and adjuncts) is prohibited. While the difficulty in finding a correct definition of (proper) government led researchers to seek alternative ways to capture these findings, the ECP produced a number of important descriptive generalizations on the distribution of movement dependencies (as reviewed in detail in Hornstein and Weinberg 1995). Early-21st-century works on the ECP have focused on deriving the CED from other principles of grammar. For example, Stepanov 2007 and Hunter 2011 adopt countercyclic insertion of adjuncts to explain why extraction out of adjuncts is ungrammatical. Müller 2010 argues that the Phase Impenetrability Condition can derive the CED. Uriagereka 1999 proposes that the specifiers and adjuncts are converted into word-like units for linearization purposes, which in turn prevent subextraction.

Hornstein, N., and A. Weinberg. 1995. The Empty Category Principle. In *Government and Binding theory and the Minimalist Program: Principles and parameters in syntactic theory*. Edited by B. Webelhuth, 241–296. Oxford: Blackwell.

Save Citation » Export Citation » E-mail Citation »

This book chapter provides an excellent review of theoretical and empirical issues concerning the ECP.

Find this resource:

Hunter, T. 2011. *Syntactic effects of conjunctivist semantics: Unifying movement and adjunction*. Amsterdam: John Benjamins.

Save Citation » Export Citation » E-mail Citation »

This book offers a precise account of phrase structure representation that is motivated by neo-Davidsonian logical forms. This account provides natural explanatory accounts of various syntactic and semantic generalizations, including the ban on extraction from adjuncts.

Find this resource:

Kayne, R. S. 1983. Connectedness. *Linguistic Inquiry* 14.2: 223–249.

Save Citation » Export Citation » E-mail Citation »

This work presents a different formulation of the ECP, where well-formedness of traces depends more on conditions on the path of nodes (called g-projection) that intervenes between the moved constituent and the trace.

Find this resource:

Lasnik, H., and M. Saito. 1992. *Move α : Conditions on its application and output*. Cambridge, MA: MIT Press.

Save Citation » Export Citation » E-mail Citation »

This monograph presents an extensive study of Subjacency and the ECP in English (an overt wh-movement language) and Japanese (a wh-in-situ language). Based on the cross-linguistic investigation of wh-movement dependencies, it proposes an important modification to the definition of antecedent government to account for the distribution of intermediate traces.

Find this resource:

Müller, G. 2010. On deriving CED effects from the PIC. *Linguistic Inquiry* 41.1: 35–82.

DOI: 10.1162/ling.2010.41.1.35 Save Citation » Export Citation » E-mail Citation »

This paper proposes that the CED can be derived from the Phase Impenetrability Condition (Chomsky 2001, cited under Foundational Works) if the grammar contained additional conditions on feature-checking operations. Available online for purchase or by subscription.

Find this resource:

Stepanov, A. 2007. The end of CED? Minimalism and extraction domains. *Syntax* 10.1: 80–126.

DOI: 10.1111/j.1467-9612.2007.00094.x Save Citation » Export Citation » E-mail Citation »

This paper proposes that the CED can be explained by a combination of (a) constraint on chain uniformity that effectively bans movement out of moved constituents (e.g., subjects), and (b) late insertion of adjuncts that renders movement out of adjuncts ungrammatical. Available online for purchase or by subscription.

Find this resource:

Uriagereka, J. 1999. Multiple spell-out. In *Working minimalism*. Edited by S. Epstein and N. Hornstein, 251–282. Cambridge, MA: MIT Press.

Save Citation » Export Citation » E-mail Citation »

This paper proposes that the CED can be deduced from an independently needed principle of grammar, namely, Linear Correspondence Axiom of Kayne 1994 (cited under Types of Movement Operations: Rightward Movement). The core insight of the proposal is that subjects and adjuncts must be spelled out as a word-like unit in order to linearize the entire structure, which

effectively renders constituents inside those domains inaccessible for further grammatical operations.

Find this resource:

RELATIVIZED MINIMALITY

A seminal work, Rizzi 1990 analyzed a subcase of antecedent government configurations (see the Empty Category Principle and Condition on Extraction Domains) in which there are more than one potential antecedent governors and proposed the Relativized Minimality (RM) condition, which was formulated as a representational constraint that bans movement of Y to X where there is an intervening category Z that c-commands Y and is of the same structural type as X. The last part of the condition effectively relativizes the condition to any type of movement dependency, and Rizzi shows that RM indeed applies to A-movement (ban on super-raising, e.g., “*John* seems that it is certain ____ to win”), A-bar movement (wh-island, e.g., “*Who* did John wonder why Mary kissed ____”), and head movement (head movement constraint, e.g., “*Kiss* John will ____ Mary?”). Subsequent works discussed questions such as whether RM is a condition of derivation or representation and how to define structural identity. Rizzi 2001 and Starke 2001 both explore how the original Relativized Minimality proposal can be reformulated under the minimalist framework.

Rizzi, L. 1990. *Relativized minimality*. Cambridge, MA: MIT Press.

Save Citation » Export Citation » E-mail Citation »

This monograph builds on Chomsky 1986 (cited under Foundational Works) and formulates the original version of RM.

Find this resource:

Rizzi, L. 2001. Relativized minimality effects. In *The handbook of contemporary syntactic theory*. Edited by M. Baltin and C. Collins, 89–110. Oxford: Blackwell.

DOI: 10.1002/9780470756416 Save Citation » Export Citation » E-mail Citation »

This chapter provides a review of RM and offers an account for how to incorporate RM in the derivational model of syntax under the minimalist framework.

Find this resource:

Starke, M. 2001. *Move dissolves into merge: A theory of locality*. PhD diss., Univ. of Geneva.

Save Citation » Export Citation » E-mail Citation »

This thesis proposes to refine the notion of “same structural type” by means of identity of lexical features involved in structurally intervening elements.

Find this resource:

SUPERIORITY

Chomsky 1973 (cited under Foundational Works) points out that in multiple wh-questions in English, the object wh-phrase cannot move across the subject wh-phrase (e.g., “*What* did John wonder who ate ____?”), and attributes this to the Superiority Condition, which prohibits a wh-phrase to move across another wh-phrase that c-commands it. Subsequent works investigated the nature of Superiority Condition across languages. Pesetsky 1987 (cited under Types of Movement Operations: Wh-In-Situ) studies English D-linked wh-questions (e.g., “*Which cake* did John eat ____?”) and shows that D-linked wh-phrases can violate the Superiority Condition. Rudin 1988 (cited under Types of Movement Operations: Cross-Linguistic Variations in Overt Wh-

Movement) points out that multiple wh-fronting languages differ in terms of whether they respect Superiority Condition or not, and Bošković 2002 (cited under Types of Movement Operations: Cross-Linguistic Variations in Overt Wh-Movement) presents a more detailed typology of superiority effects in multiple wh-fronting languages. Boeckx and Lasnik 2006 investigates the nature of superiority effects by comparing wh-island violation and superiority violation in sluicing constructions. Bruening 2001 shows that QR respects superiority, just like other overt movement operations.

Boeckx, C., and H. Lasnik. 2006. Intervention and repair. *Linguistic Inquiry* 37:150–155.

DOI: 10.1162/ling.2006.37.1.150 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

Boeckx and Lasnik observe that wh-island violations are repaired under sluicing, but superiority violations are not. Based on this observation, they argue that wh-island is a condition on structural representation, but Superiority Condition is a condition on structure derivation. Available online for purchase or by subscription.

Find this resource:

Bruening, B. 2001. QR obeys superiority: Frozen scope and ACD. *Linguistic Inquiry* 32.2: 233–273.

DOI: 10.1162/00243890152001762 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper investigates the frozen scope phenomena in double object and spray-load constructions, and argues that the rigidity of scope between two objects follows from the principle of Relativized Minimality. Available online for purchase or by subscription.

Find this resource:

ISLAND REPAIR BY SLUICING

A seminal work, Ross 1969, showed that clausal ellipsis constructions called sluicing (e.g., “John met someone, but I don’t know *who*.”) are made possible by wh-movement; here, a clausal constituent below the wh-phrase is elided while the wh-phrase remains outside the scope of ellipsis. While sluicing apparently involves wh-movement, when the wh-movement in sluicing originates from an island environment (e.g., from inside a wh-island), it does not seem to be subject to island constraints (e.g., “John wondered whether Mary kissed someone, but I don’t know *who*.”), as if the island violations are “repaired” by the ellipsis. Subsequent works attempted to understand the conditions on the sluicing operation as well as the mechanism of island repair under sluicing. Chung, et al. 1995 proposes that sluicing is derived via a copying operation at LF, and it is not subject to island constraints because it does not involve overt movement in the course of a syntactic derivation. Both Lasnik 2001 and Merchant 2001 argue against the LF-copying analysis of sluicing and argue that sluicing is a PF-operation, and the fact that sluicing repairs island violations indicates that island constraints are constraints on the PF representation. Fox and Pesetsky 2005 proposes a new theory of linearization that could explain why island constraints should be understood as a constraint on the PF representation. Wang 2007 argues that sluicing contains a resumptive pronoun in the gap position, and it is this resumptive pronoun that repairs island violations (see Island Repair by Resumption). Fox and Lasnik 2003 explores one of the puzzles for the PF deletion theory of sluicing and island repair, namely, why VP ellipsis does not repair island violations (e.g., “John wondered whether Mary kissed someone, but I don’t know *who* John did”).

Chung, S., W. A. Ladusaw, and James McCloskey. 1995. Sluicing and logical form. *Natural Language Semantics* 3:239–282.

DOI: 10.1007/BF01248819 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper proposes an LF-copying theory of ellipsis, and argues that sluicing is not subject to island constraints because it does not involve overt movement in the course of a syntactic derivation. This work also presents a detailed description of the distribution of two different types of sluicing (the merger and the sprouting). Available online for purchase or by subscription.

Find this resource:

Fox, D., and H. Lasnik. 2003. Successive-cyclic movement and island repair: The difference between sluicing and VP-ellipsis. *Linguistic Inquiry* 34.1: 143–154.

DOI: 10.1162/002438903763255959 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This article offers an explanation for why sluicing can repair island violations while a similar PF deletion operation like VP ellipsis cannot. It is argued that PF deletion in general has a structural parallelism requirement that forces an ungrammatical nonsuccessive cyclic movement in the elided clause, and this ungrammatical operation cannot be repaired in VP ellipsis contexts as the island-inducing structural environment partially remains at PF even after VP ellipsis. Available online for purchase or by subscription.

Find this resource:

Fox, D., and D. Pesetsky. 2005. Cyclic linearization of syntactic structure. *Theoretical Linguistics* 31:1–46.

DOI: 10.1515/thli.2005.31.1-2.1 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper proposes a theory of linearization that ordering statements are added to the ordering table at the end of each spell-out domain. If an ordering statement contradicts another ordering statement, the derivation crashes. This account attributes island violation to movement that produces contradictory ordering statements. This explains why sluicing repairs island violation: the ellipsis site contains no structure to linearize, so contradictory ordering statements cause no linearization problems. Available online for purchase or by subscription.

Find this resource:

Lasnik, H. 2001. When can you save a structure by destroying it? In *Proceedings of the North East Linguistics Society 31: Georgetown University*. Edited by M. Kim and U. Strauss, 301–320. Amherst: Univ. of Massachusetts, GLSA.

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Building on Ross 1969, this article argues that islands are a PF-representational constraint, and thus the PF-deletion operation, such as sluicing, can nullify the island violations.

Find this resource:

Merchant, J. 2001. *The syntax of silence: Sluicing, islands, and the theory of ellipsis*. Oxford: Oxford Univ. Press.

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Through a detailed analysis of sluicing constructions using a wide range of cross-linguistic data, this book argues that the ellipsis site in sluicing contains a full-fledged syntactic structure which is deleted at the PF level, and that many (if not all) of the island constraints that can be repaired by sluicing are constraints on the PF representation.

Find this resource:

Ross, J. R. 1969. Guess who? In *Papers from the 5th Regional Meeting of the Chicago Linguistic Society, April 18–19, 1969*. Edited by R. I. Binnick, A. Davison, G. M. Green, and J. L. Morgan, 252–286. Chicago: Chicago Linguistic Society.

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Ross's seminal work on sluicing discusses a number of distinctive syntactic properties of sluicing, and argues that the ellipsis is

associated with a full-fledged syntactic structure. This is the first place where the relation between sluicing and island violation was discussed, although Ross's original judgment slightly differed from the judgment data reported in later works (Lasnik 2001, Merchant 2001).

Find this resource:

Wang, C. A. 2007. Sluicing and resumption. In *NELS 37: Proceedings of the 37th North East Linguistic Society*. Edited by E. Elfner and M. Walkow, 239–252. Amherst, MA: GLSA.

Save Citation » Export Citation » E-mail Citation »

Building on the theory of movement and resumption in Boeckx 2003 (cited under Island Repair by Resumption), Wang argues that sluicing structures contain an elided resumptive pronoun, and on the assumption that resumption repairs island violations, this analysis also explains why sluicing can repair island violations.

Find this resource:

ISLAND REPAIR BY RESUMPTION

Ross 1967 (cited under Foundational Works) originally noted that island violations appear to be ameliorated when the trace position is occupied by a resumptive pronoun (e.g., “That’s *the girl* that I wonder when ____ met you” vs. “That’s *the girl* that I wonder when *she* met you”). This constitutes another potential “island repair” phenomenon, and its properties have been investigated in various languages (Aoun, et al. 2001; Boeckx 2003; Demirdache and Percus 2011; Shlonsky 1992). These studies have focused on the conditions on the distribution of resumptive pronouns (Shlonsky 1992) as well as how resumptive pronouns are created in the course of syntactic derivation. For example, Boeckx 2003 argues that resumptive pronouns are introduced together with their antecedents and are stranded after the antecedents move in overt syntax. Demirdache and Percus 2011 argues that resumptive pronouns move covertly at LF, while Aoun, et al. 2001 argues that apparent resumption involves movement while true resumption does not. While these studies shed light on the mechanisms of resumption strategies in repairing island violations, the empirical data on the amelioration effect is much more controversial than in the cases of island repair by sluicing (see Island Repair by Sluicing), at least in languages like English where the resumptive pronouns are argued to not behave as a variable (Chao and Sells 1983). Early-21st-century works have used controlled acceptability judgment studies to investigate whether linguists’ intuition in support of island repair can be experimentally confirmed. These studies show that English resumption shows a subject-object asymmetry; resumption in the object gap position does not repair island violations (Alexopoulou and Keller 2007; Heestand, et al. 2011; McDaniel and Cowart 1999; Omaki and Nakao 2010), while the subject gap resumption does (McDaniel and Cowart 1999).

Alexopoulou, T., and F. Keller. 2007. Locality, cyclicity, and resumption: At the interface between the grammar and the human sentence processor. *Language* 83.1: 110–160.

DOI: 10.1353/lan.2007.0001 Save Citation » Export Citation » E-mail Citation »

This paper reports a series of acceptability judgment studies on English wh-questions that show that resumption in an object position is generally not acceptable regardless of the structural distance between the wh-phrase and the trace, and that it does not ameliorate wh-island violations. Available online by subscription.

Find this resource:

Aoun, J., L. Choueiri, and N. Hornstein. 2001. Resumption, movement, and derivational economy. *Linguistic Inquiry* 32.3: 371–403.

DOI: 10.1162/002438901750372504 Save Citation » Export Citation » E-mail Citation »

This paper distinguishes two types of resumption in Lebanese Arabic, i.e., apparent resumption that is derived by movement and shows reconstruction effects, and true resumption that does not involve movement and behaves rather like a regular pronoun (e.g., it can be bound by a quantificational element). It is shown that only true resumption is available inside island contexts. Available online for purchase or by subscription.

Find this resource:

Boeckx, C. 2003. *Islands and chains: Resumption as stranding*. Amsterdam: John Benjamins.

Save Citation » Export Citation » E-mail Citation »

This book proposes a stranding analysis of resumptive pronouns, and details how this movement-based account of resumptive pronouns can explain the distribution of island repair effects in true resumption languages.

Find this resource:

Chao, W., and P. Sells. 1983. On the interpretation of resumptive pronouns. In *Proceedings of the North East Linguistics Society 13*. Edited by P. Sells and C. Jones, 47–61. Amherst, MA: GLSA.

Save Citation » Export Citation » E-mail Citation »

This important work shows that English resumptive pronouns, whether they occur inside or outside of island environments, generally do not behave as variables (called intrusive resumption), while Hebrew or Swedish resumptive pronouns do (called true resumption).

Find this resource:

Demirdache, H., and O. Percus. 2011. Resumptives, movement and interpretation. In *Resumptive pronouns at the interfaces*. Edited by A. Rouveret, 367–394. Amsterdam: John Benjamins.

Save Citation » Export Citation » E-mail Citation »

Based on a variety of resumption data from Jordanian Arabic, this paper argues that resumptive pronouns involve movement of an uninterpreted pronoun at LF rather than movement of the antecedent of the pronoun.

Find this resource:

Heestand, D., M. Xiang, and M. Polinsky. 2011. Resumption still does not rescue islands. *Linguistic Inquiry* 42.1: 138–152.

DOI: 10.1162/LING_a_00032 Save Citation » Export Citation » E-mail Citation »

This acceptability judgment study follows up on Alexopoulou and Keller 2007, and extends the investigation to object resumption for relativization, which constitutes a syntactic context in which resumption is most widely available. A series of experimental studies in English replicated Alexopoulou and Keller's findings that object resumption does not ameliorate island violations. Available online for purchase or by subscription.

Find this resource:

McDaniel, D., and W. Cowart. 1999. Experimental evidence for a minimalist account of English resumptive pronouns. *Cognition* 70.2: B15–B24.

DOI: 10.1016/S0010-0277(99)00006-2 Save Citation » Export Citation » E-mail Citation »

This acceptability judgment study shows that island repair by resumption in English depends on the structural context, namely, resumption in object position does not ameliorate wh-island violation, whereas resumption in subject position does. Available online for purchase or by subscription.

Find this resource:

Omaki , A., and C. Nakao. 2010. Does English resumption really help to repair island violations? *Snippets* 21:11–12.

Save Citation » Export Citation » E-mail Citation »

This acceptability judgment study addressed a methodological concern in Alexopoulou and Keller 2007, whose experiments used a bare wh-phrase that generally does not license resumption even in languages like Hebrew, where resumption can be used in regular gap positions. It was found that even when the bare wh-phrase is replaced with a d-linked wh-phrase, island violations are still not ameliorated by object resumption in English.

Find this resource:

Shlonsky, U. 1992. Resumptive pronouns as a last resort. *Linguistic Inquiry* 23.3: 443–468.

Save Citation » Export Citation » E-mail Citation »

Using resumptive pronoun data in Hebrew and Palestinian Arabic, this paper argues that resumptive pronouns are inserted only as a last-resort operation to save an otherwise ungrammatical derivation, even in languages like Hebrew, where resumption is generally considered to be free.

Find this resource:

CROSS-LINGUISTIC VARIATIONS IN ISLAND CONSTRAINTS

Much of the early work on island constraints generally assumed that islands must be universal, but subsequent cross-linguistic investigations revealed that what would constitute an island violation is actually grammatical in some languages, including English (Chung and McCloskey 1983, Grimshaw 1986). These findings led to proposals that bounding nodes need to be parameterized (Comorovski 1986, Rizzi 1980, Torrego 1984), or that island constraints may (partially) find natural explanations in non-syntactic factors such as pragmatics (Engdahl 1997, Erteschik-Shir 1973). In the early 21st century, experimental works are starting to revisit these findings to better understand the nature of cross-linguistic differences (Sprouse and Hornstein 2012, cited under Processing of Movement Dependencies: Island Constraints on Filler-Gap Dependency Processing). For example, Kush, et al. 2013 demonstrates that the type of relative clause island violations observed in Engdahl 1997 is also relatively acceptable in English too and explores psycholinguistic explanations for why such apparent amelioration occurs in English.

Chung, S., and J. McCloskey. 1983. On the interpretation of certain island facts in GPSG. *Linguistic Inquiry* 14.4: 704–713.

Save Citation » Export Citation » E-mail Citation »

This work reports a number of examples in which island constraints are violated and nevertheless sound grammatical, and offers an analysis based on Generalized Phrase Structure Grammar (GPSG) (Gazdar, et al. 1985, cited under Unbounded Dependencies in Non-Transformational Frameworks).

Find this resource:

Comorovski, I. 1986. Multiple wh movement in Romanian. *Linguistic Inquiry* 17.1: 171–177.

Save Citation » Export Citation » E-mail Citation »

An important work that showed that Romanian, which is a multiple wh-fronting language, allows extraction out of wh-islands even though extraction out of complex NP is still ungrammatical.

Find this resource:

Engdahl, E. 1997. Relative clause extractions in context. *Working Papers in Scandinavian Syntax* 60:51–79.

Save Citation » Export Citation » E-mail Citation »

This paper discusses naturalistic production data in Swedish that appears to involve an extraction out of a relative clause island, and argues that pragmatic factors influence the acceptability of extraction out of islands.

Find this resource:

Erteschik-Shir, N. 1973. On the nature of island constraints. PhD diss., Massachusetts Institute of Technology.

Save Citation » Export Citation » E-mail Citation »

This work examines the distribution of island violations in Danish, and shows that Danish allows extraction out of a relative clause. This is probably the first work that showed a cross-linguistic difference in the distribution of island constraints, as Danish appears to allow extraction out of a complex NP island.

Find this resource:

Grimshaw, J. 1986. Subjacency and the S/S' parameter. *Linguistic Inquiry* 17.2: 364–369.

Save Citation » Export Citation » E-mail Citation »

Following up on Rizzi 1980, which argued for parameterization of bounding nodes based on Italian wh-island data, this squib shows that English actually has sentences that replicate the Italian data. Available online for purchase or by subscription.

Find this resource:

Kush, D., A. Omaki, and N. Hornstein. 2013. Microvariation in islands? In *Experimental syntax and island effects*. Edited by J. Sprouse and N. Hornstein. Cambridge, UK: Cambridge Univ. Press.

Save Citation » Export Citation » E-mail Citation »

Reports acceptability judgment studies that show that the apparent relative clause island violations reported in Engdahl 1997 are relatively acceptable in English as well. It is argued that the critical structural property that improves the acceptability is that the relative clause island following a predicate selects a small clause, which leads to a grammatical illusion that the relative clause behaves like a pseudo-relative in Romance languages.

Find this resource:

Rizzi, L. 1980. Violations of the wh-island condition in Italian and the subjacency condition. *Journal of Italian Linguistics* 5:157–195.

Save Citation » Export Citation » E-mail Citation »

This work examined properties of wh-island constraint in Italian, and argued that in Italian, the bounding nodes are S' (=CP) and NP, unlike in English, where the bounding nodes were considered to be S (=IP) and NP.

Find this resource:

Torrego, E. 1984. On inversion in Spanish and some of its effects. *Linguistic Inquiry* 15.1: 103–129.

Save Citation » Export Citation » E-mail Citation »

Based on the distribution of obligatory and optional verb inversion in Spanish that is triggered by wh-fronting, it is argued that the initial movement can skip the C node of the immediate clause. Available online for purchase or by subscription.

Find this resource:

Unbounded Dependencies in Non-Transformational Frameworks

In non-transformational frameworks, movement does not exist as a grammatical operation; long-distance dependencies are instead analyzed by enriching operations and representations that are independently needed in each respective framework. For example, Gazdar, et al. 1985 and Pollard and Sag 1994 introduce enriched phrase structure rules with special features that are used in long-distance dependencies. Steedman 1996 also uses a special structural representation for fillers, which essentially requires that the filler be combined with a category missing an argument. In the Lexical Functional Grammar framework, Kaplan and Zaenen 1995 proposes that the f(unctional)-structure level of representation can be used to represent a link between the filler and the gap.

Gazdar, G., E. Klein, G. Pullum, and I. Sag. 1985. *Generalized phrase structure grammar*. Cambridge, MA: Harvard Univ. Press.

Save Citation » Export Citation » E-mail Citation »

Generalized Phrase Structure Grammar (GPSG) is one of the earliest attempts to create a grammar formalism that has a left-to-right derivation, unlike the transformational theory of grammar. Instead of using movement operations, this formalism represents long-distance dependencies by positing a slash feature that is passed from the head of the dependency to the tail of the dependency.

Find this resource:

Kaplan, R. M., and A. Zaenen. 1995. Long-distance dependencies, constituent structure, and functional uncertainty. In *Formal issues in lexical-functional grammar*. Edited by M. Dalrymple, A. Zaenen, J. Maxwell III, and R. M. Kaplan, 137–165. Stanford, CA: CSLI.

Save Citation » Export Citation » E-mail Citation »

This paper presents a detailed discussion of how nonlocal dependencies can be explained in the Lexical Functional Grammar (LFG) framework. It is proposed here that the f(unctional)-structure level of representation can be used to represent a link between the filler and the gap, and that island constraints can be expressed as constraints on the possible functional path between categories.

Find this resource:

Pollard, C. J., and I. A. Sag. 1994. *Head-driven phrase structure grammar*. Chicago: Univ. of Chicago Press.

Save Citation » Export Citation » E-mail Citation »

In Head-Driven Phrase Structure Grammar (HPSG), long-distance dependencies are analyzed as involving a chain of local links

between the head and tail of a dependency (so-called “gap”). The links are introduced by phrase structure rules that add a gap feature (or slash categories) to category labels (e.g., SGAP, VPGAP) that indicate that a dependency needs to be established between the two distant structural positions.

Find this resource:

Steedman, M. 1996. *Surface structure and interpretation*. Cambridge, MA: MIT Press.

Save Citation » Export Citation » E-mail Citation »

In the analysis of filler-gap dependency in Steedman’s Combinatorial Categorical Grammar framework, a filler such as a *wh*-phrase will be assigned to a category such as S/(S/NP), which essentially requires that the filler will be combined with a category missing an argument.

Find this resource:

Processing of Movement Dependencies

Movement dependencies have attracted a great deal of attention from psycholinguists largely for two reasons. First, due to the fact that long-distance dependencies create a large distance between two constituents that need to be combined, such dependencies make it more feasible to experimentally probe the details of structure-building operations. Second, due to the linearity of natural language input, movement dependencies require the parser to relate two constituents that occur at two distant time points. This effectively requires a working memory system that holds the earlier, dislocated constituent (the so-called *filler*) and makes it accessible for later structural integrations at the thematic position (the so-called *gap*). As such, investigations of long-distance dependency processing allow us to probe how working memory mechanisms support real-time language comprehension. Phillips and Wagers 2007 provides an excellent summary of these empirical findings and theoretical issues.

Phillips, C., and M. Wagers. 2007. Relating structure and time in linguistics and psycholinguistics. In *Oxford handbook of psycholinguistics*. Edited by M. G. Gaskell, 739–756. Oxford: Oxford Univ. Press.

DOI: 10.1093/oxfordhnb/9780198568971.001.0001 Save Citation » Export Citation » E-mail Citation »

This article discusses the relation between linguistic theories and psycholinguistics by taking long-distance dependency processing as a case study. As such, it provides a comprehensive summary of issues and findings in psycholinguistics of movement dependencies.

Find this resource:

ACTIVE GAP CREATION

Many psycholinguistic studies on movement dependencies investigated how the parser identifies the phonetically silent gap. Fodor 1978 discusses two possible strategies for gap creation: one possible strategy is to wait until after the gap position to posit a gap; this strategy to wait for bottom-up evidence on gap locations increases the parse accuracy because the presence of a missing complement for verbs or prepositions is a strong signal for a gap, but it also requires the parser to hold the filler in memory for a longer time. Another possible strategy is to actively posit a gap at the first grammatically permissible position; this incremental and somewhat reckless strategy allows the parser to integrate the filler into structure and reduce memory cost, while it increases the chances of creating a wrong parse. Sentence processing studies using various time course measures demonstrated overwhelming evidence for the active gap creation mechanism across languages. Crain and Fodor 1985 and Stowe 1986 (cited under Island Constraints on Filler-Gap Dependency Processing) used a so-called filled-gap paradigm to provide the earliest experimental evidence for active gap creation. Garnsey, et al. 1989 uses an Event-Related Potential (ERP)

measure to provide evidence for active gap creation, and Sussman and Sedivy 2003 presents similar evidence using a visual world eye-tracking method. Cross-linguistic psycholinguistic data from Aoshima, et al. 2004 (Japanese) and Frazier and Flores d'Arcais 1989 (Dutch) demonstrates that active gap creation applies to the linearly first grammatically permissible gap position. Boland, et al. 1995 argues that when the earliest gap position is hosted by a verb, the application of active gap creation may depend on the argument structure of the verb.

Aoshima, S., C. Phillips, and A. Weinberg. 2004. Processing filler-gap dependencies in a head-final language. *Journal of Memory and Language* 51.1: 23–54.

DOI: 10.1016/j.jml.2004.03.001 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper investigates active gap creation processes in Japanese, a verb-final language. The evidence reported here suggests that active creation of a gap, which precedes the verb in Japanese, is executed without relying on information from the verb. Available online for purchase or by subscription.

Find this resource:

Boland, J. E., M. K. Tanenhaus, S. M. Garnsey, and G. N. Carlson. 1995. Verb argument structure in parsing and interpretation: Evidence from *wh*-questions. *Journal of Memory and Language* 34.6: 774–806.

DOI: 10.1006/jmla.1995.1034 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study uses a stop-making-sense technique to investigate the interaction of active gap creation processes and verb subcategorization frames. The findings suggest that active gap creation may be postponed or cancelled when the critical verb is an object control verb like *persuade* that could take a recipient NP and a clause as its complements. Available online for purchase or by subscription.

Find this resource:

Crain, S., and J. D. Fodor. 1985. How can grammars help parsers? In *Natural language parsing: Psychological, computational, and theoretical perspectives*. Edited by D. R. Dowty, L. Karttunen, and A. M. Zwicky, 94–128. Cambridge, UK: Cambridge Univ. Press.

DOI: 10.1017/CBO9780511597855.004 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper reports the first experimental evidence for active gap creation.

Find this resource:

Fodor, J. D. 1978. Parsing strategies and constraints on transformations. *Linguistic Inquiry* 9.3: 427–473.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This is the first paper that presented theoretical discussions of advantages and disadvantages of active gap creation. Available online for purchase or by subscription.

Find this resource:

Frazier, L., and G. B. Flores d'Arcais. 1989. Filler driven parsing: A study of gap filling in Dutch. *Journal of Memory and Language* 28.3: 331–344.

DOI: 10.1016/0749-596X(89)90037-5 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study investigates filler-gap dependency processing in Dutch and presents the first evidence for active gap creation in the subject position. Available online for purchase or by subscription.

Find this resource:

Garnsey, S. M., M. K. Tanenhaus, and R. M. Chapman. 1989. Evoked potentials and the study of sentence comprehension. *Journal of Psycholinguistic Research* 18.1: 51–60.

DOI: 10.1007/BF01069046 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study presents the first evidence for active gap creation using an ERP measure. This is also the first study that probed active gap creation by using the so-called plausibility mismatch design, which manipulates the semantic compatibility between the wh-filler and the selectional restriction of the verb. Available online for purchase or by subscription.

Find this resource:

Sussman, R. S., and J. Sedivy. 2003. The time-course of processing syntactic dependencies: Evidence from eye movements. *Language and Cognitive Processes* 18:143–163.

DOI: 10.1080/01690960143000498 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study reports evidence for active gap creation using a visual world eye-tracking paradigm. Available online for purchase or by subscription.

Find this resource:

ISLAND CONSTRAINTS ON FILLER-GAP DEPENDENCY PROCESSING

The active gap creation bias shows that the parser makes a rather reckless attempt to shorten the filler-gap dependency despite the risk of hypothesizing a potentially incorrect analysis. On the other hand, the parser is not completely reckless: it has been shown that the parser respects island constraints and avoids creating a gap inside islands (see Constraints on Movement). The real-time application of island constraints has been robustly observed in studies using various techniques such as self-paced reading (Stowe 1986, Wagers and Phillips 2009; see also Phillips 2006, cited under Islands and Cognitive Constraints), eye-tracking during reading (Traxler and Pickering 1996), Event-Related Potential (ERP) (McKinnon and Osterhout 1996), and speed-accuracy tradeoff (McElree and Griffith 1998). Omaki and Schulz 2011 extended these findings to second language learners as well. These findings have a general implication that structure-building operations are guided by linguistic or cognitive constraints that constitute islands. It is important to note that this is also a research domain in which experimental work has had an impact on syntactic theorizing of islands. See Sprouse and Hornstein 2012 for a collection of such papers.

McElree, B., and T. Griffith. 1998. Structural and lexical constraints on filling gaps during sentence comprehension: A time-course analysis. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 24.2: 432–460.

DOI: 10.1037/0278-7393.24.2.432 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study uses a speed-accuracy tradeoff task to reveal that the island constraints prevent a retrieval of the wh-filler.

Find this resource:

McKinnon, R., and L. Osterhout. 1996. Constraints on movement phenomena in sentence processing: Evidence from event-related brain potentials. *Language and Cognitive Processes* 11.5: 495–524.

DOI: 10.1080/016909696387132 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper reports Event-Related Potential data indicating that wh-island violations cause a certain ERP pattern (known as a P600) that is generally taken to indicate that the parser detected a syntactic anomaly. Available online for purchase or by subscription.

Find this resource:

Omaki , A., and B. Schulz. 2011. Filler-gap dependencies and island constraints in second language sentence processing. *Studies in Second Language Acquisition* 33:563–588.

DOI: 10.1017/S0272263111000313 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study shows that second language learners of English respect relative clause island constraints in the same way native speakers do, and argues against the view that second language learners are unable to build syntactic representations with structural details (Clahsen, H., and C. Felser. 2006. Grammatical processing in language learners. *Applied Psycholinguistics* 27:3–42). Available online for purchase or by subscription.

Find this resource:

Sprouse, Jon, and Norbert Hornstein. 2012. *Experimental syntax and island effects*. Cambridge, UK: Cambridge Univ. Press.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This book is a collection of papers on theoretical and empirical issues of island constraints. One feature that distinguishes this volume from others on islands is that many of the articles in this volume use various experimental techniques to address theoretical issues on island constraints.

Find this resource:

Stowe, A. 1986. Parsing WH-constructions: Evidence for on-line gap location. *Language and Cognitive Processes* 1:227–245.

DOI: 10.1080/01690968608407062 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This is a seminal work for two reasons. First, this is one of the first studies that reported a filled-gap effect, i.e., a reading time slowdown at the actual object of a verb, which indicates that the parser treated the wh-phrase as the object of the verb. Second, this is the first study that showed that active gap creation does not occur inside islands. Available online for purchase or by subscription.

Find this resource:

Traxler, M. J., and M. J. Pickering. 1996. Plausibility and the processing of unbounded dependencies: An eye-tracking study. *Journal of Memory and Language* 35.3: 454–475.

DOI: 10.1006/jmla.1996.0025 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This eye-tracking during reading study uses the plausibility mismatch design (Garnsey, et al. 1989, cited under Active Gap Creation), to show that active gap creation does not occur inside a relative clause island. Available online for purchase or by subscription.

Find this resource:

Wagers, M. W., and C. Phillips. 2009. Multiple dependencies and the role of the grammar in real-time comprehension. *Journal of Linguistics* 45.2: 395–433.

DOI: 10.1017/S0022226709005726 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study reports self-paced reading experiments that show that the Coordinate Structure Constraint causes the parser to expect ATB extraction. Available online for purchase or by subscription.

Find this resource:

MOVEMENT AND SENTENCE COMPLEXITY

Movement dependencies have played a central role in research on the perception of sentence complexity. The link between movement dependencies and sentence complexity was originally proposed in Miller and Chomsky 1963, which claimed that an application of transformational rule translates into an increase of sentence complexity. This idea later became known as the Derivational Theory of Complexity. While this theory has seen mixed results (for review, see Fodor, et al. 1974), it has led later psycholinguistics works to investigate how sentence complexity could be explained by investigating parsing operations in more detail. Gibson 1998 proposed to account for sentence complexity in terms of two parsing operations that burden the working memory system, namely, (a) predictions of dependencies that need to be stored in working memory (storage cost) and (b) completion of those dependencies that require a memory retrieval of the earlier constituent and its structural integration (integration cost). Chen, et al. 2005 reports an empirical support for the notion of storage cost, and Grodner and Gibson 2005 presents reading time evidence for the presence of integration cost. Gibson's 1998 proposal inspired many experimental and computational psycholinguistic studies that attempted to understand the role of these memory operations in sentence complexity, such as Levy 2008, which reinterprets Gibson's work in terms of a probabilistic parsing mechanism, or Lewis and Vasishth 2005, which argues that the integration cost reflects interference effects in cue-based memory retrieval processes.

Chen, E., E. Gibson, and F. Wolf. 2005. Online syntactic storage costs in sentence comprehension. *Journal of Memory and Language* 52.1: 144–169.

DOI: 10.1016/j.jml.2004.10.001 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper reports a series of self-paced reading experiments that show that the reading time increases in regions between the head and tail of a dependency. Available online for purchase or by subscription.

Find this resource:

Fodor, J. A., M. F. Garrett, and T. G. Bever. 1974. *The psychology of language: An introduction to psycholinguistics and generative grammar*. Illustrated ed. New York: McGraw-Hill.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

Chapter 5 of this book provides a comprehensive review of the experimental works that tested the Derivational Theory of Complexity.

Find this resource:

Gibson, E. 1998. Linguistic complexity: Locality of syntactic dependencies. *Cognition* 68.1: 1–76.

DOI: 10.1016/S0010-0277(98)00034-1 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper proposes the Syntactic Prediction Locality Theory, which accounts for linguistic complexity in terms of memory cost associated with maintenance of syntactic predictions and structural completion of long-distance dependencies.

Find this resource:

Grodner, D., and E. Gibson. 2005. Consequences of the serial nature of linguistic input for sentential complexity. *Cognitive Science* 29.2: 261–290.

DOI: 10.1207/s15516709cog0000_7 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper reports self-paced reading studies that show that the memory cost associated with completion of long-distance dependencies varies as a function of the number of intervening discourse referents.

Find this resource:

Levy, R. 2008. Expectation-based syntactic comprehension. *Cognition* 106.3: 1126–1177.

DOI: 10.1016/j.cognition.2007.05.006 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper proposes an expectation-based model of sentence comprehension that allocates its resources to more probable parses. This model is argued to account for the perceived complexity of many sentences, as complex sentences involve less probable parses that require a costly reallocation of processing resources. Available online for purchase or by subscription.

Find this resource:

Lewis, R. L., and S. Vasishth. 2005. An activation-based model of sentence processing as skilled memory retrieval. *Cognitive Science* 29.3: 375–419.

DOI: 10.1207/s15516709cog0000_25 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper proposes an ACT-R-based model of sentence processing that has a detailed account of how working memory supports structure-building operations. This model can account for the complexity of certain constructions in terms of interference effects that result from cue-based memory retrieval processes.

Find this resource:

Miller, G., and N. Chomsky. 1963. Finitary models of language users. In *Handbook of mathematical psychology*. Edited by R. D. Luce, R. R. Bush, and E. Galanter, 419–491. New York: Wiley.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper discusses the proposal that each transformational rule application results in an increase of linguistic complexity.

Find this resource:

REACTIVATION OF FILLERS AT GAP POSITIONS

Much research has investigated whether the parser reactivates the fillers precisely at gap positions that are predicted by linguistic theories. The primary form of evidence consists of three kinds: (a) semantic reactivation of displaced phrases at the end of the sentence (Bever and McElree 1988, Bever and Sanz 1997) or directly at the gap position (Love and Swinney 1996); (b) time course evidence for gap creation at the earliest gap position (Traxler and Pickering 1996, cited under Island Constraints on Filler-Gap Dependency Processing) or an intermediate trace position (Gibson and Warren 2004); and (c) grammatical errors in production when the dependency is intervened by an intermediate trace (Franck, et al. 2010). While some of this work was taken to constitute evidence for traces, the same results can also be achieved in other systems that do not require a trace (e.g., Pickering and Barry 1991; for discussion, see Phillips and Wagers 2007, cited under Processing of Movement Dependencies).

Bever, T. G., and B. McElree. 1988. Empty categories access their antecedents during comprehension. *Linguistic Inquiry* 19.1: 35–43.

[Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study uses an end-of-sentence probe recognition technique to argue that semantic reactivation of the filler occurs only in sentences with movement dependencies. Available online for purchase or by subscription.

Find this resource:

Bever, T. G., and M. Sanz. 1997. Empty categories access their antecedents during comprehension: Unaccusatives in Spanish. *Linguistic Inquiry* 28.1: 69–91.

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This study uses the end-of-sentence probe recognition technique of Bever and McElree 1988 and argues that unaccusative verbs cause raising while unergative verbs do not. Available online for purchase or by subscription.

Find this resource:

Franck, J., G. Soare, U. H. Frauenfelder, and L. Rizzi. 2010. Object interference in subject–verb agreement: The role of intermediate traces of movement. *Journal of Memory and Language* 62.2: 166–182.

DOI: [10.1016/j.jml.2009.11.001](#) [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study uses a sentence completion technique to show that subject-verb agreement errors occur more often when the trace of a dislocated object noun phrase structurally intervenes between the subject and the verb in the course of derivation. Available online for purchase or by subscription.

Find this resource:

Gibson, E., and T. Warren. 2004. Reading-time evidence for intermediate linguistic structure in long-distance dependencies. *Syntax* 7.1: 55–78.

DOI: [10.1111/j.1368-0005.2004.00065.x](#) [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study shows that the integration of a wh-filler is much less costly if the sentence contained an additional [Spec, CP] where the filler could be reactivated. Available online for purchase or by subscription.

Find this resource:

Love, T., and D. Swinney. 1996. Coreference processing and levels of analysis in object-relative constructions: Demonstration of antecedent reactivation with the cross-modal priming paradigm. *Journal of Psycholinguistic Research* 25.1: 5–24.

DOI: [10.1007/BF01708418](#) [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study reports a cross-modal priming experiment that demonstrates semantic activation of the filler at the gap position. Available online for purchase or by subscription.

Find this resource:

Pickering, M., and G. Barry. 1991. Sentence processing without empty categories. *Language and Cognitive Processes* 6.3: 229–259.

DOI: 10.1080/01690969108406944 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper argues that (psycho)linguistic evidence for gaps does not necessarily require a structural representation for trace, and that it can be interpreted as involving a direct semantic association between the filler and the host of the gap (e.g., verbs).

Available online for purchase or by subscription.

Find this resource:

ISLANDS AND COGNITIVE CONSTRAINTS

In the transformational grammar literature, island constraints have been treated as one of the primary cases of grammatical constraints on syntactic representations and derivations (see Constraints on Movement). However, focusing on the fact that islands tend to involve complex structures, subsequent works such as Deane 1991, Hofmeister and Sag 2010, Kluender 2004, Kluender and Kutas 1993, and Pritchett 1991 have explored the possibility that island constraints could be reduced to cognitive constraints on the parser, such as limitations on the attention or memory resources that are recruited for sentence processing operations. These arguments primarily consist of plausibility arguments: Given the co-occurrence of island constraints and independently motivated cognitive or parsing constraints, islands could be reduced to cognitive constraints. However, some studies have presented experimental evidence that goes against the predictions of such reductionist accounts. For example, Phillips 2006 shows that the parser actively posits a gap in structural domains that could serve as an island when it is not followed by a parasitic gap. Sprouse, et al. 2012 shows that there is no direct relation between independently measured working memory capacity and the degree to which participants violate island constraints. While the debate remains unresolved, this literature constitutes a primary example of experimental research that could inform grammatical theories.

Deane, P. 1991. Limits to attention: A cognitive theory of island phenomena. *Cognitive Linguistics* 2.1: 1–64.

DOI: 10.1515/cogl.1991.2.1.1 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper reports sentences that violate island constraints and nevertheless appear to be acceptable. Based on such data, Deane develops a theory of island constraints that attributes unacceptability of island violations to resource limitations on the attention mechanism. Available online for purchase or by subscription.

Find this resource:

Hofmeister, P., and I. A. Sag. 2010. Cognitive constraints and island effects. *Language* 86.2: 366–415.

DOI: 10.1353/lan.0.0223 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper reports self-paced reading experiments and acceptability judgment studies that argue for a reductionist account of island constraints. These experiments show that structural manipulation that reduces processing complexity can facilitate processing or improve acceptability judgment of island violations, and it is argued that this correlation is best accounted for if the island constraints themselves were constraints on language processing.

Find this resource:

Kluender, R. 2004. Are subject islands subject to a processing account? In *WCCFL 23: Proceedings of the 23rd West Coast Conference on Formal Linguistics*. Edited by V. Schmeister, V. Chand, A. Kelleher, and A. Rodriguez, 101–125. Somerville, MA: Cascadilla.

Save Citation » Export Citation » E-mail Citation »

This paper focuses on the nature of subject island constraint, and argues that subject islands could be reduced to memory resource limitation.

Find this resource:

Kluender, R., and M. Kutas. 1993. Subacency as a processing phenomenon. *Language and Cognitive Processes* 8.4: 573–633.

DOI: 10.1080/01690969308407588 Save Citation » Export Citation » E-mail Citation »

This study reports acceptability judgment and ERP experiments on processing of wh-island violations. Based on the observation that the second wh-phrase that causes a wh-island violation leads to a significant increase of N400 as well as a left-anterior negativity that is considered to reflect large memory demands, it is argued that wh-island violation results from parsing operations that exceed the limits of working memory. Available online for purchase or by subscription.

Find this resource:

Phillips, C. 2006. The real-time status of island phenomena. *Language* 82.4: 795–823.

DOI: 10.1353/lan.2006.0217 Save Citation » Export Citation » E-mail Citation »

This study shows that the parser does not posit a gap inside the subject island with a finite relative clause, but posits a gap inside the nonfinite subject island, which can be ameliorated when followed by a parasitic gap. This challenges the reductionist view of islands, which predicts that the parser should never posit a gap inside a potential island environment. Available online by subscription.

Find this resource:

Pritchett, B. L. 1991. Subacency in a principle-based parser. In *Principle-based parsing: Computation and psycholinguistics*. Edited by R. C. Berwick, S. P. Abney, and C. Tenny, 301–345. Dordrecht, The Netherlands: Kluwer.

Save Citation » Export Citation » E-mail Citation »

This paper argues that island constraints could be characterized as structural domains that violate the independently motivated parsing principles of Theta Attachment and Theta Reanalysis Constraint.

Find this resource:

Sprouse, J., M. Wagers, and C. Phillips. 2012. A test of the relation between working-memory capacity and syntactic island effects. *Language* 88.1: 82–123.

DOI: 10.1353/lan.2012.0004 Save Citation » Export Citation » E-mail Citation »

The cognitive resource limitation account of islands predicts that individual differences in working memory capacity should correlate with the ability to tolerate island constraints. This paper argues against this cognitive account of islands by showing that island constraints are respected regardless of the independently measured working memory span size, and the degree to which a sentence is rated unacceptable is not correlated with memory span size.

Find this resource:

Movement in Child Language

Movement has attracted much attention in language acquisition research due to its cross-linguistic differences as well as its constraints that have been hypothesized to be innate and universal. While many studies reported evidence for children's sophisticated knowledge of constraints on movement dependencies, children's poor command of certain movement dependencies has led to productive investigations of how children's grammatical knowledge interacts with their ability to deploy the knowledge in language comprehension and production.

STRUCTURE DEPENDENCE AND SUBJECT-AUX INVERSION

The most fundamental principle of movement operations is that they target constituents in hierarchical phrase structure representations. The primary example is subject-aux inversion (e.g., "Will Mary ____ kiss John?"): the grammatically correct characterization of this operation is to move the auxiliary dominated by the Infl of the matrix clause, but it is easy to imagine that learners may hypothesize a computationally simpler, incorrect rule stated in terms of linear order, e.g., move the first auxiliary in the sentence. Moreover, the relevant input is mostly compatible with either hypothesis (Legate and Yang 2002). This led to a long-standing debate on whether the knowledge of structure dependence needs to be innately given to children. Crain and Nakayama 1987 provided the first experimental evidence that children respect the structure dependency constraint on subject-aux inversion, while Ambridge, et al. 2008 reported children's production errors that could be analyzed as evidence for a structure-independent subject-aux inversion rule. Lewis and Elman 2001 argues that a simple recurrent network can deduce structure dependence when trained with a simplified input. Reali and Christiansen 2005 shows that simple recurrent networks as well as statistical models based on bigrams or trigrams can learn structure dependence through child-directed speech corpora, although Kam, et al. 2008 argued against the success of Reali and Christiansen's bigram learner. Perfors, et al. 2011 argued that an ideal Bayesian learner can correctly select a phrase structure grammar that is necessary for stating structure-dependent rules. However, see Berwick, et al. 2011 for critical evaluations of these computational modeling works and arguments that none of these studies convincingly argues against the innateness of structure dependence.

Ambridge, B., C. F. Rowland, and J. M. Pine. 2008. Is structure dependence an innate constraint? New experimental evidence from children's complex-question production. *Cognitive Science* 32.1: 222–255.

DOI: 10.1080/03640210701703766 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper reports an elicited production study that attests British children's production of subject-aux inversion errors that appear to be compatible with a linear version of subject-aux inversion rule. It remains to be seen whether these are evidence for incorrect rule formation or for mere production errors. Available online for purchase or by subscription.

Find this resource:

Berwick, R. C., P. Pietroski, B. Yankama, and N. Chomsky. 2011. Poverty of the stimulus revisited. *Cognitive Science* 35.7: 1207–1242.

DOI: 10.1111/j.1551-6709.2011.01189.x [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper provides a comprehensive summary of empirical and theoretical arguments for and against the innateness of structure dependence principle. Available online for purchase or by subscription.

Find this resource:

Crain, S., and M. Nakayama. 1987. Structure dependence in grammar formation. *Language* 63.3: 522–543.

DOI: 10.2307/415004 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

The first elicited production study that showed that children's subject-aux inversion respects structure dependence. Available online for purchase or by subscription.

Find this resource:

Kam, X. N., I. Stoyneshka, L. Torniyova, J. D. Fodor, and W. G. Sakas. 2008. Bigrams and the richness of the stimulus. *Cognitive Science* 32.4: 771–787.

DOI: 10.1080/03640210802067053 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study probes the details of the input distribution and bigram learners explored in Reali and Christiansen 2005 and argues against the claim that the input contains sufficient statistical information for learning the structure dependence principle.

Find this resource:

Legate, J. A., and C. D. Yang. 2002. Empirical re-assessment of stimulus poverty arguments. *Linguistic Review* 19.1–2: 151–162.

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This paper investigates the distribution of subject-aux inversion in child-directed speech, and shows that sentences that provide unique positive evidence for structure-dependent subject-aux inversion rule constitute less than 0.07 percent of yes-no questions in the input.

Find this resource:

Lewis, J. D., and J. Elman. 2001. Learnability and the statistical structure of language: Poverty of stimulus arguments revisited. In *Proceedings of the 26th Annual Boston University Conference on Language Development*. Edited by B. Skarabela, S. Fish, and A. H. Do, 359–370. Somerville, MA: Cascadilla.

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This paper shows that at least when the input contains a simplified set of sentences coded in lexical categories, a simple recurrent network can learn to prefer the structure-dependent subject-aux inversion rule to the structure-independent rule.

Find this resource:

Perfors, A., J. B. Tenenbaum, and T. Regier. 2011. The learnability of abstract syntactic principles. *Cognition* 118:306–338.

DOI: 10.1016/j.cognition.2010.11.001 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper reports a computational modeling study that shows that an ideal learner can use Bayesian inference to select a grammar with hierarchical structure over other forms of grammars. As Berwick, et al. 2011 points out, however, this does not guarantee that a learner will formulate structure-dependent rules. Available online for purchase or by subscription.

Find this resource:

Reali, F., and M. H. Christiansen. 2005. Uncovering the richness of the stimulus: Structure dependence and indirect statistical evidence. *Cognitive Science* 29.6: 1007–1028.

DOI: 10.1207/s15516709cog0000_28 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper builds on Lewis and Elman 2001 by showing that simple recurrent networks as well as statistical models based on bigrams or trigrams can learn the structure-dependent subject-aux inversion rule based on child-directed speech corpora.

Find this resource:

DEVELOPMENT OF A-MOVEMENT

Theories of language acquisition must account for how a learner's immature knowledge develops over time. One possibility that has been explored is that certain grammatical principles respect a biologically specified maturational schedule. For example, Borer and Wexler 1987 proposed that any dependencies that involve A-movement (e.g., passive, raising) undergo a maturational process (for details of these constructions, see *Types of Movement Operations: A-Movement*). This hypothesis led to a number of cross-linguistic investigations on the development of A-movement dependencies, and has received mixed findings. Data was obtained from Russian unaccusative in Babyonyshev, et al. 2001 and from English subject raising in Hirsch and Wexler 2008, while Fox and Grodzinsky 1998 reported counter-evidence based on children's comprehension of short passives, and Demuth, et al. 2010 showed that Sesotho children understand passives more successfully and argued against the maturation hypothesis, which predicts that children are universally poor at comprehending passive sentences. Syntactic priming studies such as Savage, et al. 2006 and Messenger, et al. 2011 explored the possibility that children's poor comprehension of constructions with A-movement may be due to their immature processing mechanism.

Babyonyshev, M., J. Ganger, D. Pesetsky, and K. Wexler. 2001. The maturation of grammatical principles: Evidence from Russian unaccusatives. *Linguistic Inquiry* 32.1: 1–44.

DOI: 10.1162/002438901554577 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study lends support to the A-chain maturation hypothesis by showing evidence for Russian children's immature knowledge of unaccusative constructions. Available online for purchase or by subscription.

Find this resource:

Borer, H., and K. Wexler. 1987. The maturation of syntax. In *Parameter setting*. Edited by T. Roeper and E. Williams, 123–172. Dordrecht, The Netherlands: Reidel.

DOI: 10.1007/978-94-009-3727-7 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper proposes that the grammatical ability to represent A-chains undergoes maturation, and argues that children's apparent success with passives with actional verbs is due to their misanalysis of passive participles as adjectival passives. Available online for purchase or by subscription.

Find this resource:

Demuth, K., F. Moloi, and M. Machobane. 2010. 3-Year-olds' comprehension, production, and generalization of Sesotho passives. *Cognition* 115.2: 238–251.

DOI: 10.1016/j.cognition.2009.12.015 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study shows that three-year-old Sesotho-speaking children are able to comprehend passive constructions well. The author attributes the contrast between Sesotho and English to more frequent occurrences of passive constructions in the Sesotho input. Available online for purchase or by subscription.

Find this resource:

Fox, D., and Y. Grodzinsky. 1998. Children's passive: A view from the *by*-phrase. *Linguistic Inquiry* 29.2: 311–332.

DOI: 10.1162/002438998553761 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study argues against the A-chain maturation hypothesis by reporting that children are more successful in comprehending

short passives without a *by*-phrase. Available online for purchase or by subscription.

Find this resource:

Hirsch, C., and K. Wexler. 2008. The late development of raising: What children seem to think about seem. In *New horizons in the analysis of control and raising*. Edited by W. Davies and S. Dubinsky, 35–70. Dordrecht, The Netherlands: Springer.

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This study shows that children have difficulties comprehending raising constructions with *seem*, and argues for a version of A-chain maturation hypothesis that is restated in terms of a phase-based model of grammar.

Find this resource:

Messenger, K., H. P. Branigan, and J. F. McLean. 2011. Evidence for (shared) abstract structure underlying children's short and full passives. *Cognition* 121.2: 268–274.

DOI: 10.1016/j.cognition.2011.07.003 Save Citation » Export Citation » E-mail Citation »

This study reports a syntactic priming experiment with three- and four-year-old children. It was found that children were more likely to produce full passive descriptions after hearing short passive primes, which suggests that children at this age already have shared abstract syntactic representations for short and full passives. Available online for purchase or by subscription.

Find this resource:

Savage, C., E. Lieven, A. Theakston, and M. Tomasello. 2006. Structural priming as implicit learning in language acquisition: The persistence of lexical and structural priming in 4-year-olds. *Language Learning and Development* 2.1: 27–49.

DOI: 10.1207/s15473341lild0201_2 Save Citation » Export Citation » E-mail Citation »

This study uses passive priming experiments to show that (a) priming can improve children's production of passive constructions, and (b) this learning effect can persist for several weeks. Available online for purchase or by subscription.

Find this resource:

DEVELOPMENT OF WH-MOVEMENT AND QR

Wh-constructions and QR have attracted much attention from language acquisition researchers for three reasons. First, these constructions show a number of cross-linguistic differences (e.g., overt wh-movement vs. wh-in-situ, multiple wh-fronting vs. single wh-fronting, etc.) and thus present opportunities to investigate how children acquire parametric differences across languages. For example, McDaniel, et al. 1995 used an acceptability judgment method and showed that English-speaking children may undergo a stage in which the parameters for wh-constructions are incorrectly set. Similarly, Goro 2007 shows that Japanese children's Quantifier Raising rules resemble those of English-speaking adults rather than those of Japanese-speaking adults. Second, these constructions have played a major role in discovery of universal syntactic principles (e.g., the ECP, islands) and covert operations (wh-in-situ, QR), which challenges language learners due to the abstractness of those operations and principles (for details of these structures and constraints, see Types of Movement Operations and Constraints on Movement). In this domain, experimental studies have shed light on children's early sophistication in syntactic knowledge. For example, de Villiers and Roeper 1995 showed that children respect relative clause island constraints, and Sugisaki 2012 also shows that Japanese children respect the ECP in interpretation of wh-in-situ constructions. Syrett and Lidz 2009 argues that children's grammars allow Quantifier Raising in Antecedent Contained Deletion constructions. On the other hand, Friedmann, et al. 2009 argues that Hebrew-speaking children's knowledge of Relativized Minimality may be slightly different from that of adults. Finally, Seidl, et al. 2003 and Omaki 2010 have capitalized on the complexity of long-distance dependency processing to start to

uncover how the sentence processing mechanism develops in children.

de Villiers, J. D., and T. Roeper. 1995. Relative clauses are barriers to *wh*-movement for young children. *Journal of Child Language* 22.2: 389–404.

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This study uses a Question-after-Story task to show that English-speaking three- to six-year-old children respect the relative clause island constraint. Available online for purchase or by subscription.

Find this resource:

Friedmann, N., A. Belletti, and L. Rizzi. 2009. Relativized relatives: Types of intervention in the acquisition of A-bar dependencies. *Lingua* 119.1: 67–88.

DOI: 10.1016/j.lingua.2008.09.002 Save Citation » Export Citation » E-mail Citation »

This paper reports a series of comprehension and production experiments that show that Hebrew-speaking preschoolers have more difficulties with object *wh*-questions in which the *wh*-phrase and the subject NP are the same referential type than with object *wh*-questions in which they differ in referential type. Friedmann and colleagues argue that this results from a grammatical intervention effect unique to children. Available online for purchase or by subscription.

Find this resource:

Goro, T. 2007. Language-specific constraints on scope interpretation in first language acquisition. PhD diss., Univ. of Maryland.

Save Citation » Export Citation » E-mail Citation »

This dissertation reports a series of Truth Value Judgment studies with Japanese children and shows that Japanese children allow English-like Quantifier Raising that is not allowed in the Japanese adult grammar.

Find this resource:

McDaniel, D., B. Chiu, and T. L. Maxfield. 1995. Parameters for *Wh*-movement types: Evidence from child English. *Natural Language & Linguistic Theory* 13.4: 709–753.

DOI: 10.1007/BF00992856 Save Citation » Export Citation » E-mail Citation »

This study reports acceptability judgment data from English-speaking three- to five-year-old children that shows that some children accept partial *wh*-movement, *wh*-copying, and multiple *wh*-movement constructions that do not exist in English. Available online for purchase or by subscription.

Find this resource:

Omaki, A. 2010. Commitment and flexibility in the developing parser. PhD diss., Univ. of Maryland.

Save Citation » Export Citation » E-mail Citation »

This dissertation investigates English and Japanese preschoolers' comprehension of biclausal *wh*-questions. Experimental and corpus studies show that (a) children have an active gap creation bias and often fail to revise their initial analysis of *wh*-constructions, and (b) these unique properties of the child parser could skew the input distribution available to children.

Find this resource:

Seidl, A., G. Hollich, and P. W. Jusczyk. 2003. Early understanding of subject and object wh-questions. *Infancy: The Official Journal of the International Society on Infant Studies* 4.3: 423–436.

DOI: 10.1207/S15327078IN0403_06 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This study used the intermodal preferential looking procedure to examine comprehension of English wh-questions by thirteen-, fifteen-, and twenty-month-olds. It was found that twenty-month-olds comprehended both subject and object questions, fifteen-month-olds appeared to understand only subject questions, and thirteen-month-olds did not understand either question type.

Find this resource:

Sugisaki, K. 2012. LF *Wh*-movement and its locality constraints in child Japanese. *Language Acquisition* 19.2: 174–181.

DOI: 10.1080/10489223.2012.633845 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper reports a Question-after-Story task that shows that Japanese children respect locality constraints on adjunct wh-in-situ questions. Available online for purchase or by subscription.

Find this resource:

Syrett, K., and J. Lidz. 2009. QR in child grammar: Evidence from antecedent-contained deletion. *Language Acquisition* 16.2: 67–81.

DOI: 10.1080/10489220902769226 [Save Citation »](#) [Export Citation »](#) [E-mail Citation »](#)

This paper reports a Truth Value Judgment experiment that shows that English-speaking four-year-olds show knowledge of Quantifier Raising in Antecedent Contained Deletion constructions. Available online for purchase or by subscription.

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DOI: 10.1093/OBO/9780199772810-0114

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