University of California, Santa Barbara

Lexical flexibility in discourse:

A quantitative corpus-based approach

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy in Linguistics

by

Daniel W. Hieber

Committee in Charge:

Professor Marianne Mithun, Chair

Professor Bernard Comrie

Professor Stefan Th. Gries

Professor William Croft (University of New Mexico)

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The dissertation of Daniel W. Hieber is approved.

Bernard Comrie

Stefan Th. Gries

William Croft

Marianne Mithun, Committee Chair

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https://github.com/dwhieb/dissertation

Dedication

Acknowledgments

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Curriculum Vitae

Daniel W. Hieber

Education

December 2020	Ph.D. in Linguistics, University of California, Santa Barbara
March 2016	M.A. in Linguistics, University of California, Santa Barbara
June 2008	B.A. in Linguistics & Philosophy, The College of William & Mary (magna cum laude)

Professional Experience

2018–2019	Editor, Custom Language Products, Rosetta Stone
2015–2017	Teaching Assistant, Department of Linguistics, University of California, Santa Barbara
2014–2015	Research Assistant (under Prof. Carol Genetti), Department of Linguistics, University of California, Santa Barbara
2011–2013	Associate Researcher, Research Labs, Rosetta Stone
2008–2011	Editor, Endangered Languages Program, Rosetta Stone
2007–2008	Intern, Endangered Languages Program, Rosetta Stone
2006	Spanish Instructor, Nielsen Builders
2004–2006	Lab Assistant, Language Lab, The College of William & Mary
2003–2004	Latin Instructor, Bridgewater Home School Unit

Publications

2019	The Chitimacha language: A history. In Nathalie Dajko & Shana Walton (eds.), *Languages in Louisiana: Community & culture* (America's Third Coast Series). University Press of Mississippi.
2019	Semantic alignment in Chitimacha. *International Journal of American Linguistics* 85(3): 313–363. doi:10.1086/703239.
2018	Category genesis in Chitimacha: A constructional approach. In Kristel Van Goethem, Muriel Norde, Evie Coussé, & Gudrun Vanderbauwhede (eds.), *Category change from a constructional perspective* (Constructional Approaches to Language 20), 15–46. John Benjamins. doi:10.1075/cal.20.02hie.
2016	*The cohesive function of prosody in Ékegusií (Kisii) narratives: A functional-typological approach.* M.A. thesis, University of California, Santa Barbara.

2013 On linguistics, language, and our times: A linguist's narrative reviewed. *Linguistic Typology* 17(2): 291–321. Review article of *I am a linguist* by R. M. W. Dixon (Brill, 2010). doi:10.13140/RG.2.2.13238.96329.

2013 (with Sharon Hargus & Edward Vajda, eds.) *Working papers in Athabaskan (Dene) languages 2012.* Alaska Native Language Center Working Papers 11. ANLC.

Awards

2019 SSILA Best Student Presentation Award

2015 National Science Foundation (NSF) Graduate Student Research Fellowship (GRFP)

2015 2nd place, University of California Grad Slam

2015 Winner, University of California, Santa Barbara Grad Slam

2013 Chancellor's Fellowship, University of California, Santa Barbara

2006 Boren Scholarship, National Security Education Program (NSEP)

Fields of Study

Major Fields: Linguistic Typology, Language Documentation & Description, Language Revitalization, Prosody, Discourse, Language Change, Language Contact, Digital Linguistics, Corpus Linguistics

Linguistic Typology with Professor Bernard Comrie & Professor Marianne Mithun

Language Documentation & Description with Professor Eric Campbell, Professor Carol Genetti, & Professor Marianne Mithun

Language Revitalization with Professor Carol Genetti

Prosody with Professor Carol Genetti, Professor Matthew Gordon, & Professor Marianne Mithun

Discourse with Professor Patricia Clancy, Professor John W. DuBois, Professor Carol Genetti, & Professor Marianne Mithun

Language Change with Professor Marianne Mithun

Language Contact with Professor Marianne Mithun

Digital Linguistics with Professor Eric Campbell & Professor Stefan Th. Gries

Corpus Linguistics with Professor Eric Campbell, Professor John W. DuBois, & Professor Stefan Th. Gries

Abstract

Lexical flexibility in discourse:

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This thesis is a quantitative corpus-based study of lexical flexibility in English (Indo-European) and Nuuchahnulth (Wakashan). *Lexical flexibility* is the capacity of lexical items to serve in more than one discourse function—reference, predication, or modification (or more traditionally, noun, verb, or adjective). In this thesis I develop a procedure and metric for quantifying the lexical flexibility of words in a corpus, and apply that metric to English and Nuuchahnulth. I find that the two languages differ drastically in not only their degree of lexical flexibility, but the way in which that flexibility is realized. This study advances the discussion of lexical flexibility—as well as parts of speech more generally—by adding a new kind of empirical evidence to the discussion (quantitative corpus-based data), and in doing so provides answers to several longstanding and much-debated questions about how lexical categories operate in English and Nuuchahnulth.

The abstract should include 1) a brief statement of the problem; 2) a description of the methods and procedures used to gather data or study the problem; 3) a condensed summary of the findings. The abstract should be double-spaced. The recommended length is 1–2 pages. (add Abstract)

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List of Abbreviations

The following table provides the meaning of each abbreviation used in interlinear glossed examples throughout this thesis.

1	first person
2	second person
3	third person
ACC	accusative
AGR	agreement
AGT	agent
CAUS	causative
COMPL	completive
CONN	connective
DEF	definite
EMPH	emphatic
EP	epenthetic
FIN	finite
FUT	future
HAB	habitual
HUM	human
INCEP	inceptive
IND	indicative
INDEF	indefinite
INSTR	instrumental
IPFV	imperfective
LINK	linker
MOM	momentaneous
NEG	negative
NEUT	neutral position
NF	non-first person
PAST	past
PFV	perfective
PL	plural
PLACT	pluractional
PRES	present tense
REFL	reflexive
SG	singular
SPEC	specific
SS	same subject
SUBJ	subject
TR	transitive
VZR	verbalizer

List of Languages

The following table provides information about each language mentioned in this thesis: the name of the language in English (following Haspelmath [2017]), the International Standards Organization (ISO) 693-3 language code, and the Glottolog code (Hammarström, Forkel & Haspelmath 2019). Genealogical information follows the format `family > phylum`.

Language Name (English)	**ISO 639-3**	**Glottocode**	**Genetic Affiliation**
Basque	`eus`	`basq1248`	isolate
Castilian Spanish	`spa`	`cast1244`	Indo-European > Romance
Cayuga	`cay`	`cayu1261`	Iroquoian > Northern Iroquoian
Chamorro	`cha`	`cham1312`	Austronesian > Malayo-Polynesian
Cherokee	`chr`	`cher1273`	Iroquoian > Southern Iroquoian
Chitimacha	`ctm`	`chit1248`	isolate
Central Alaskan Yup'ik	`esu`	`cent2127`	Eskimo-Aleut > Yupik
Classical Greek	`grc`	`anci1242`	Indo-European > Hellenic
Classical Nahuatl	`nci`	`clas1250`	Uto-Aztecan > Nahuan
Dutch	`nld`	`mode1257`	Indo-European > Germanic
English	`eng`	`stan1293`	Indo-European > Germanic
French	`fra`	`stan1290`	Indo-European > Romance
German	`deu`	`uppe1397`	Indo-European > Germanic
Gooniyandi	`gni`	`goon1238`	Bunuban
Indonesian	`ind`	`indo1316`	Austronesian > Malayan

Irish (Gaelic)	gle	iris1253	Indo-European > Celtic
Latin	lat	lati1261	Indo-European > Italic
Kuikuro	kui	kuik1245	Cariban > Nahukwa
Kutenai	kut	kute1249	isolate
Mandarin Chinese	cmn	mand1415	Sino-Tibetan > Sinitic
Mandinka	mnk	mand1436	Mande > Manding
Middle English	enm	midd1317	Indo-European > Germanic
Mixtec	various	mixt1427	Oto-Manguean > Mixtecan
Mundari	unr	mund1320	Austroasiatic > Munda
Munya (Muya)	mvm	muya1239	Sino-Tibetan > Qiangic
Narragansett	xnt	narr1280	Algic > Eastern Algonquian
Navajo	nav	nava1243	Na-Dene > Athabaskan
North Efate (Nguna)	llp	nort2836	Austronesian > Oceanic
Nuuchahnulth (Nootka)	nuk	nuuc1236	Wakashan > Southern Wakashan
Occitan	oci	occi1239	Indo-European > Romance
Old English	ang	olde1238	Indo-European > Germanic
Quechua	qwe	quec1387	Quechuan
Quiché Maya	quc	kich1262	Mayan > Quichean
Russian	rus	russ1263	Indo-European > Balto-Slavic
Soddo	gru	kist1241	Afroasiatic > Ethiopic
Spanish	spa	stan1288	Indo-European > Romance
Standard Arabic	ara	arab1395	Afroasiatic > Semitic
Sundanese	sun	sund1251	Austronesian > Malayo-Polynesian
Tagalog	tgl	taga1280	Austronesian > Philippine
Tarascan (Purépecha)	tsz	tara1323	isolate
Timucua	tjm	timu1245	isolate
Tongan	ton	tong1325	Austronesian > Polynesian

Tuscan (Italian)	`cay`	`cayu1261`	Indo-European > Romance
Tzeltal Maya	`tzh`	`tzel1254`	Mayan > Cholan > Tzeltalan
Ute	`ute`	`utee1244`	Austronesian > Polynesian
Wambon	`wms`	`ketu1239`	Trans-New Guinea > Awyu-Dumut
Welsh	`cym`	`wels1247`	Indo-European > Celtic
Wolof	`wol`	`wolo1247`	Niger-Congo > Senegambian
Yucatec Maya	`yua`	`yuca1254`	Mayan > Yucatec
Zapotec	`zap`	`zapo1437`	Oto-Manguean > Zapotecan

Conventions

This note documents the conventions I have adopted regarding linguistic data, terminology, and presentation of data throughout this thesis.

Interlinear Examples

It is well known that the world's languages realize widely different sets of morphosyntactic categories (Whaley 1997: 58; Haspelmath 2007). Moreover, even when these categories bear the same name, they may differ drastically in their behavior (Dixon 2010: 9). It is the subject of much debate whether these language-specific categories can be mapped onto each other or compared in any useful way (Croft 1995; Song 2001: 10–15; Croft 2003: 13–19; Haspelmath 2010a,c; Newmeyer 2010; Stassen 2011; Hieber 2013: 308–310; Croft 2014; Plank 2016; Song 2018: 44–58). Recognizing these difficulties, I have made no attempt to standardize the linguistic terminology used in examples from different languages. I have, however, standardized the abbreviations used to refer to those terms. For example, even though one researcher may abbreviate Subject as SUBJ and another researcher abbreviate it as SUB, I nonetheless gloss all Subject morphemes as SUBJ. See the List of Abbreviations for a complete list of glossing abbreviations.

I have not attempted to standardize the transcription systems and orthographies used in examples. All examples are given as transcribed in their original source. The reader should consult those original sources for further details regarding orthography.

In all interlinear glossed examples, I follow the formatting conventions (but not necessarily the recommended abbreviations) of the Leipzig Glossing Rules (Bickel, Comrie & Haspelmath 2015). The source of each example is always provided after the example itself.

Prose

It is increasingly common in typological studies to write language-particular terms and categories with an initial capital letter, and to write terms that refer to language-general or semantic/functional concepts (e.g. the crosslinguistic notion of subject) in lowercase (Comrie 1976: 10; Bybee 1985: 47 (fn. 3), 141; Croft 2000: 66; Haspelmath 2010a: 674; Croft 2014: 535). For example, the English Participle suffix *-ing* is, obviously, specific to English, and does not exist in any other language; therefore it is capitalized and written as *Participle*. If, however, a writer is discussing the category of participles generally and crosslinguistically, not specific to any particular language, the term is written in lowercase as *participle*. I follow these same capitalization conventions in this thesis.

Quotations

Within quotations, *italics* indicate emphasis in the original, while **boldface** indicates my emphasis.

Chapter 1

Introduction

This chapter motivates the need for research on lexical flexibility by situating it within broader concerns regarding linguistic categories more generally, and categories in human cognition. The specific problem addressed is our lack of understanding regarding what lexical flexibility looks like, and how it varies across languages. This thesis contributes to answering these questions via a quantitative corpus-based study of lexical flexibility in English (Indo-European > Germanic) and Nuuchahnulth (Wakashan > Southern Wakashan). It is the first study to examine lexical flexibility using natural discourse data from corpora. This chapter provides an overview of the thesis, including the specific research questions addressed, the data and methods used, a concise summary of the results, and a preview of the conclusions.

1.1 The "problem" of lexical flexibility

Word classes such as noun, verb, and adjective (traditionally called *parts of speech*) were once thought to be universal, easily identifiable, and easily understood. Today they are one of the most controversial and least understood aspects of language. While language scientists agree that word classes exist, there is much disagreement as to whether they are categories of individual languages, categories of language generally, categories of human cognition, categories of language science, or some combination of these possibilities (Mithun 2017: 166; Haspelmath 2019; Hieber forthcoming). Lexical categorization—how languages assign words[1] to

[1]In this thesis, I use the two terms *word* and *lexical item* interchangeably as a convenient cover terms for root, stem, or fully-inflected word. These terms do not here refer to phonological words, syntactic words, or any

categories—is of central importance to theories of language because it is tightly interconnected with linguistic categorization generally, which in turn informs (and is informed by) our understanding of cognition. Categorization is a fundamental feature of human cognition (Taylor 2003: xi; van Lier & Rijkhoff 2013: 2–3), and lexical categorization is perhaps the most foundational issue in linguistic theory (Croft 1991: 36; Vapnarsky & Veneziano 2017a: 1).

One challenge for traditional theories of word classes is the existence of *lexical flexibility*—the use of a word in more than one discourse function with no overt derivational morphology, whether it is used to refer (like a noun), to predicate (like a verb), or to modify (like an adjective). In traditional terms, flexible words are those which may be used for more than one part of speech. (A more precise definition of lexical flexibility is given in §2.5.) Examples of flexible words in several languages are shown below. In the examples, **N** stands for a word being used nominally, **V** for a word being used verbally, and **A** for a word being used adjectivally. The flexible word in each set of examples is shown with **emphasis**.

(1) English (Indo-European > Germanic)

N: And the spots of **paint** would change every hundred degrees.
(Ide & Suderman 2005: FrancisClem)

V: One story does come to my mind though where you **painted** the foundation coating on the house and got tar all over you.
(Ide & Suderman 2005: BorelRaymondHydellII)

A: And it happened to be one of the rare **paint** jobs.
(Ide & Suderman 2005: sw2236)

(2) Mandinka (Mande > Manding)

N: **Kuuráŋ**-o mâŋ díyaa.
sick-DEF PFV.NEG pleasant
'Sickness is not pleasant.' (Creissels 2017: 46)

V: Díndíŋ-o máŋ **kuraŋ**.
child-DEF PFV.NEG **sick**
'The child is not sick.' (Creissels 2017: 46)

(3) Mundari (Austroasiatic > Munda)

other concept of word. The reason for this vague usage is because languages vary as to which linguistic level bears category information. This issue is discussed more fully in Section 2.3.2.3.

N: **buru**=ko bai-ke-d-a.
mountain=3PL.SUBJ make-COMPL-TR-IND
'They made the mountain.' (Evans & Osada 2005: 354)

V: saan=ko **buru**-ke-d-a.
firewood=3PL.SUBJ **mountain**-COMPL-TR-IND
'They heaped up the firewood.' (Evans & Osada 2005: 355)

(4) Nuuchahnulth (Wakashan > Southern Wakashan)

N: watqšiƛ ʔaƛimt …
watq-ši(ƛ) **ʔaƛa**-imt …
swallow-MOM **two**-PAST …
completely.swallowed two …
'He swallowed two of them […]' (Louie 2003: Qawiqaalth 57)

V: wiƛ̓aƛ haʔukšiƛ ʔaƛiičiƛ
wik-ʾaƛ haʔuk-ši(ƛ) **ʔaƛa**-ʻi·čiƛ
not-FIN eat-MOM **two**-INCEP
didn't ate became.two
'He (Mink) didn't eat them and the crabs became two.' (Louie 2003: Mink 266)

A: hiiɬtqyaap̓up ʔaƛa qʷayaċiik
hiɬ-tqya·p̓i-up **ʔaƛa** qʷayaċi:k
there-back-MOM.CAUS **two** wolf
put.on.the.back two wolf
'Two wolves put (the dead wolf) on their back.' (Louie 2003: FoodThief 46)

(5) Quechua (Quechuan)

N: rikaška: **hatun**-(kuna)-ta
I.saw **big**-(PL)-ACC
'I saw the big one(s)' (Schachter & Shopen 2007: 17)

V: chay runa **hatun** (kaykan)
that man **big** is
'that man is big' (Schachter & Shopen 2007: 17)

A: chay **hatun** runa
that **big** man
'that big man' (Schachter & Shopen 2007: 17)

(6) Tongan (Austronesian > Polynesian)

N: naʾe lele e kau **feﬁné**
PAST run SPEC PL.HUM **woman**.DEF
'The women were running.' (Broschart 1997: 134)

V: na'e **fefine** kotoa e kau lelé
PAST **woman** all SPEC PL.HUM run.DEF
'The ones running were all female.' (Broschart 1997: 134)

(7) Central Alaskan Yup'ik (Eskimo-Aleut > Yup'ik)

a. *iqa-* 'dirt'; 'be dirty'
-ngtak 'very'
N: ***iqa-ngtak*** 'one that is very dirty'
V: ***iqa-ngtaq-*** 'be very dirty'
(Mithun 2017: 159)

b. *tangerr-* 'see'
-uaq 'imitation, inauthentic'; 'pretend to, without serious purpose'
N: ***tangerr-uaq*** 'movie, vision, hallucination'
V: ***tangerr-uar-*** 'hallucinate, watch a movie'
(Mithun 2017: 159)

c. *iqeq-* 'corner of mouth'
-mik 'thing held in one's mouth'; 'to put in one's'
N: ***iq-mik*** 'chewing tobacco'
V: ***iq-mig-*** 'put in one's mouth'
(Mithun 2017: 160)

In the English example in (1), the predicative use of *paint* takes the English Past Tense suffix *-ed* like any prototypical verb in English, but there is no morpheme present that explicitly converts the word from noun to verb (or vice versa). The remaining examples illustrate the same situation for a variety of language families around the world. Even though in some cases there is inflectional morphology indicating the function of the word, none of these examples have explicit derivational morphology converting the target words from one function to another.

Flexible words like those in the examples above create an analytical problem for traditional theories of parts of speech. Traditional theories assume that words can be partitioned into mutually exclusive categories based on a clear set of criteria, an approach that has its roots in the Aristotelian tradition of defining a category via its necessary and sufficient conditions. Flexible words would seem to violate this assumption because they appear to be members of more than one category at once, and the criteria for classifying them yield conflicting results.

Researchers have proposed numerous solutions to this problem. The most common re-

sponse is to adjust the selectional criteria so that only certain features are considered definitional of the class, allowing these researchers to dismiss other, potentially contradictory evidence as irrelevant (Baker [2003]; Dixon & Aikhenvald [2004]; Palmer [2017]; Floyd [2011] for Quechua; Chung [2012] for Chamorro). It is also common to analyze different uses of a putatively flexible word as instances of *heterosemy*—that is, entirely distinct words which share the same form but belong to different word classes (Lichtenberk 1991). In this view, heterosemous words are related only historically, via a process of conversion or functional shift, in essence denying the existence of lexical flexibility (Evans & Osada 2005). Another approach is to say that languages exhibiting flexibility have only some of the traditional categories. A notable example of this is Launey's (Launey 1994; 2004) analysis of Classical Nahuatl (Uto-Aztecan), which he calls an *omnipredicative* language. In this analysis, all lexical words are predicates, so there is just one giant class of verbs.

Some researchers enthusiastically embrace the existence of lexical flexibility and abandon a commitment to the traditional categories of noun, verb, and adjective. Instead they analyze flexible lexemes as belonging to a broader, flexible word class such as "flexibles", "contentives" or "non-verbs", etc. (Hengeveld & Rijkhoff 2005; Luuk 2010). Other researchers abandon the commitment to word classes entirely. Mandarin, Tagalog, Tongan, Riau Indonesian, and Proto-Indo-European have each been analyzed as lacking parts of speech by some researchers (see Simon [1937], McDonald [2013], and Sun [2020] for discussions of early analyses of Mandarin; Gil [1995] for Tagalog; Broschart [1997] for Tongan; Gil [1994] for Riau Indonesian; Kastovsky [1996] for Proto-Indo-European). Within generative linguistics, the Distributed Morphology framework takes it as an assumption that all word roots are category-neutral (Siddiqi 2018). In a more functionalist orientation, Farrell (2001) argues that *all* instances of flexible words (which he describes as cases of "functional shift") involve roots underspecified for category.

Note that these differences in perspective do not arise from disagreements about the empirical facts. Researchers mostly agree on the empirical data, but disagree on the relative

importance of various pieces of evidence, and on which criteria should be taken as diagnostic of a category (Wetzer 1992: 235; Stassen 1997: 32; Croft & van Lier 2012: 58). Examples of contested languages include those of the Iroquoian family (W. Chafe 2012), Mundari (Evans & Osada 2005; Hengeveld & Rijkhoff 2005), Quechua (Schachter & Shopen 2007: 17; Floyd 2011), and Sundanese (Robins 1968: 352; Hardjadibrata 1985: 62–63), with many others that could be cited as well. It is rare that an argument for flexibility is refuted by linguistic facts alone (though see Mithun's [2000] response to Sasse [1988] regarding Cayuga).

Since analyses of lexical flexibility depend more on the theoretical commitments of the researchers involved rather than any crucial pieces of evidence, this leads to an intractable problem: researchers cannot agree on the criteria that should be considered diagnostic for a given category in a specific language (let alone crosslinguistically). Instead they partake in *methodological opportunism* (Croft 2001b: 30), choosing the evidence and criteria which best support their theoretical commitments. Discussions in the literature about the existence of a particular category in a particular language are therefore often unproductive, and devolve into debates about theoretical assumptions or the relevance or importance of various pieces of evidence, which are ultimately unresolvable (Croft 2005: 435).

This is particularly unfortunate because lexical flexibility is by no means an isolated or minor phenomenon. Additional examples like those above could be provided for many or perhaps even all the world's languages. Lexical flexibility is not as rare or marginal as traditional approaches to word classes lead one to believe. In a survey of word classes in 48 indigenous North American languages (Hieber forthcoming), every one of the languages surveyed exhibited lexical flexibility in at least some area of the grammar (although not all authors analyzed these cases as such). In my own experience researching lexical flexibility over the last decade, I have yet to encounter a language that does not exhibit a degree of flexibility in at least some words, however marginally. The prevalence with which different areas of the grammars of the world's languages lack sensitivity to the distinctions between reference (nouns), predication (verbs), and modification (adjectives) suggests that the existence of lexical categories in

a language is not necessarily a given (Hieber forthcoming).

Indeed, given what we know from both cognitive science and diachronic linguistics, it would be surprising if clear-cut categories *did* exist. Word meanings, lexical categories, and mental categories are all prototypal[2] (Taylor 2003), and language change is both gradual and gradient (Hopper & Traugott 2003; Traugott & Trousdale 2010) There will be more or less central members of any given category, and at any given point in time a word might be in a stage of transition or expansion from one category into another, meaning that it will show attributes of both.

Likewise, languages develop constructions dedicated to signaling the discourse functions of reference, predication, and modification over time, but at any given point in time, a language may have few or many of these constructions, and they may be at various stages of development (Vogel 2000). Given these facts, the real curiosity is how discourse functions come to be grammaticalized in language over time, not why it is that some languages lack such distinctions in certain areas of their grammars. Lexical flexibility is not so much a problem as it is a design feature of language. It is precisely the liminal categorial[3] status of flexible words that makes them interesting:

> In the functionalist view, linguists should recognize the boundary status of the cases in question and try to understand why they are boundary cases. The major empirical fact that has led to concrete results for typology is the discovery that the cross-linguistic variation in such things as the basic grammatical distinctions is patterned. (Croft 1991: 23)

It is only recently that lexical flexibility has become an object of study in itself, rather than a problem to be solved. As explained above, most prior studies aim to advance a particular analysis rather than to expand empirical coverage of the phenomenon. While they often pro-

[2]In this thesis, I use the term *prototypical* to mean 'having the properties of the prototype, exemplar, or central member of a category' and the term *prototypal* to mean 'having a prototype structure, with central and less central members'. The term *prototypal* is borrowed from the programming community, where it is used to describe programming languages (such as JavaScript) in which objects inherit properties from shared prototypes. Word classes may be described as prototypal, and their members as prototypical or non-prototypical.

[3]In this thesis, I use the term *categorical* to mean 'without exception; unconditional' and the term *categorial* to mean 'having to do with categories'.

vide numerous examples, they are neither quantitative nor comprehensive. As yet, there are only a small number of empirical investigations into the extent and nature of lexical flexibility in individual languages (let alone crosslinguistically). What follows is a brief synopsis of the existing studies of this latter type.

1.2 Previous research

The existing studies on the empirical extent of lexical flexibility are of two types: lexicon-based studies which examine dictionaries to determine whether words may be used for multiple functions, and corpus-based studies which examine whether and how often words are used for multiple functions in discourse.

An early lexicon-based study, though not explicitly focused on lexical flexibility, is Croft's (1984) study of categories of Russian word roots (summarized in Croft [1991: 66]). Croft finds that Russian roots are unmarked, or among the least marked forms, when their semantic category (object, action, or property) aligns with their discourse function (reference, predication, or modification respectively). When roots are used for discourse functions that are atypical for their meaning—in other words, when they are used flexibly—they are marked in some way (or at least as marked as their prototypical uses). These data suggest that lexical flexibility is constrained in a principled way, by what Croft calls the *typological markedness of parts of speech* (explained in detail in §2.4).

A study of Mundari, Evans & Osada (2005) conduct a dictionary analysis using a focused 105-word sample as well as a larger 5,000 word-sample. In the 105-word sample, 74 words (72%) could be used as either noun or verb. In the larger sample, 1,953 words (52%) could be used as both noun and verb. The complete figures for the large sample are shown in Table 1.1. Evans & Osada argue on the basis of these data that, because not all the words in the Mundari lexicon are flexible, Mundari is *not* a flexible language. As with any whole-language typology, however, this is an oversimplification. To overlook the flexibility of these words ignores the

behavior of a vast portion of the lexicon. It is exactly this flexible behavior which is of interest in this thesis. Evans & Osada's study constitutes an important contribution to our knowledge of the empirical extent of lexical flexibility across languages.

Table 1.1: Percentage of words used as nouns, verbs, or both in Mundari (Austroasiatic > Munda) (Evans & Osada 2005: 383)

noun only	772	20%
verb only	1,099	28%
noun and verb	1,953	52%
Total	3,824	100%

Mithun (2017: 163) also conducts a lexicon-based analysis of words roots in Central Alaskan Yup'ik (Eskimo-Aleut > Yupik) using Jacobson's (2012) exhaustive dictionary, and shows that only a small minority of roots (12%) are flexible, and can be used as both nouns and verbs. The results of this study are shown in Table 1.2. Mithun reports that the words in these groups cannot be characterized in any general or semantic way. Mithun's finding that flexibility in Yup'ik is rather marginal is surprising given that Yup'ik was the focus of an extensive debate about whether the language distinguished nouns and verbs (Sadock 1999). The fixation with these marginal cases in the literature seems disproportionate to their actual frequency of occurrence, again illustrating the disconnect between research advancing a particular analysis and research aiming to improve empirical coverage of the phenomenon. Just as with Mundari, however, it would be an oversight to simply ignore these flexible cases. Instead we should ask what accounts for the large difference in the extent of flexibility in the lexicons of Mundari versus Yup'ik.

Table 1.2: Percentage of words used as nouns, verbs, or both in Central Alaskan Yup'ik (Eskimo-Aleut > Yupik) (Mithun 2017: 163)

noun only	35%
verb only	53%
noun and verb	12%
Total	100%

In summary, existing lexicon-based studies have yielded differing results, each contributing to our understanding of lexical flexibility, but there are still too few such studies to draw any general conclusions.

Corpus-based studies of lexical flexibility are also scarce. In a study of the discourse functions of property words in English and Mandarin, Thompson (1989) reports that predicative uses of adjectives are in fact more common than attributive (modifying) uses of adjectives in conversation. The resulting figures from this study are shown in Table 1.3. Some of the attributive adjectives reported in Table 1.3 have "anaphoric head nouns" (Thompson 1989: 258), meaning that they are adjectives functioning to refer, so the figures presented are not entirely representative of the pragmatic functions of these words. The study also does not discuss the extent to which *individual* words exhibit this predicate-modifier flexibility—we only have the data in aggregate—and it also excludes any prototypical nouns being used to modify. These methodological choices are appropriate for a study of the discourse uses of prototypical adjectives, but the result is that we cannot infer much about the extent of lexical flexibility in English or Mandarin from this study.

Table 1.3: Distribution of functions of property words in English (Indo-European > Germanic) and Mandarin (Sino-Tibetan > Sinitic) (Thompson 1989: 253, 257)

	English		Mandarin	
predicative adjectives	209	86%	243	71%
attributive adjectives	34	14%	97	29%

Nonetheless, Thompson's study suggests a functional underpinning to the observed flexibility in prototypical property words. She finds that property words have primarily two functions in discourse: 1) to introduce new referents; and 2) to predicate an attribute about a referent. It is therefore no surprise that property words in some languages have their own specialized constructions, since they represent a unique mix of referring and predicating functions. However it is equally unsurprising that some languages encode property concepts using either referring or predicating constructions, since prototypical adjectives exhibit be-

havior related to both functions.

A similar study to Thompson's is Croft's (1991: §2.5) investigation of *textual markedness*, which refers to the fact that prototypical uses of a word are more frequent than non-prototypical uses of a word in texts (as might be expected by prototype theory; Taylor 2003: 56). Croft counts the frequency with which object, action, and property words are used for each of the pragmatic functions of reference, predication, and modification in four languages: Quiché Maya (Mayan), North Efate (Austronesian), Soddo (Austroasiatic), and Ute (Uto-Aztecan). The resulting counts give confirmation to textual markedness theory. In all four languages, the most frequent use of words is in their prototypical function. Object words are most frequently used to refer, action words are most frequently used to predicate, and property words are most frequently used to modify. Like Thompson's (1989) study, however, we do not know these distributions for individual words. Additionally, Croft's data include cases of overtly marked uses of words in non-prototypical functions, which would not be considered instances of lexical flexibility.

Finally, there are some studies which count the proportion of nouns vs. verbs. vs. adjectives in English texts (Hudson 1994; Polinsky & Magyar 2020). Again, the data are not disaggregated to the word level, so no firm conclusions can be draw about the extent of lexical flexibility.

In sum, no existing studies examine the distribution of pragmatic functions for individual words, and limit themselves to only flexible (morphologically unmarked) cases. To my knowledge, the studies just reviewed exhaust those that take an empirical approach to determining the extent of lexical flexibility in or across languages. There are numerous additional studies of lexical flexibility, but these either a) focus on particular analyses or theories of flexible words rather than attempt to expand the empirical coverage of lexical flexibility, as mentioned earlier; or b) focus on various dimensions of the *behavior* of flexible words rather than studying the overall *prevalence* of flexibility. This point is not a criticism, but simply a recognition of a lacuna in existing research. The emergent literature which treats lexical

flexibility as a phenomenon of interest in its own right and applies empirical data to the task of understanding its behavior has advanced our knowledge of the various ways lexical flexibility can be realized, and what the constraints on that variation are. Existing research shows, for example, that lexical flexibility is constrained and shaped by the very principles that give rise to the crosslinguistic categories of noun, verb, and adjective in the first place (Croft 2000; 2005; Croft & van Lier 2012). This literature and its many findings are reviewed in Section 2.3.

There is however still much to discover about lexical flexibility. Most significantly, we do not yet know the overall prevalence of the phenomenon. Most grammatical descriptions of flexibility present a relatively small set of handpicked examples, so that we do not know how representative these examples are. Croft (2001b: 70) makes this point nicely:

> How do we know that when we read a grammar of an obscure "flexible" language X that the author of the grammar has systematically surveyed the vocabulary in order to identify what proportion is flexible? If English were spoken by a small tribe in the Kordofan hills, and all we had was a 150 page grammar written fifty years ago, might it look like a highly flexible language? (Croft 2001b: 70)

Equally significant (and equally unknown) is whether there are any commonalities among words or languages which exhibit greater flexibility than others. These questions are relevant even if one adopts the position that flexible uses of words are truly heterosemous, related only historically. There remains the question of how such rampant heterosemy arises in the first place. Are there patterns or principles that guide the emergence of heterosemous forms? Whether one prefers to analyze this phenomenon as conversion, zero derivation, functional shift, polycategoriality, heterosemy, acategoriality, or something else, the fact is we do not yet have a strong empirical grasp of just how this phenomenon is realized in the world's languages. This thesis is a first foray into filling that empirical gap. The following section describes the contribution made by this thesis to addressing this gap, and gives an overview of the present study.

1.3 Overview of this study

This thesis is a quantitative corpus-based study of lexical flexibility in English (Indo-European > Germanic) and Nuuchahnulth (Wakashan > Southern Wakashan). It is exploratory and descriptive, with the primary goal of describing the prevalence of lexical flexibility within and across languages. The specific research questions investigated are as follows:

R1: How flexible are words in English and Nuuchahnulth?

R2: Is there a correlation between degree of lexical flexibility for a word and frequency (or corpus dispersion)?

R3: How do the semantic properties of words pattern with respect to their flexibility?

I explore each of these questions from several angles. R1, "How flexible are words in English and Nuuchahnulth?" is the core focus of this thesis. To answer it, I count the frequency with which lexical words are used for each of the three functions of reference, predication, and modification in a corpus of spoken texts for each language. Each word is given a flexibility rating from 0 to 1 based on how evenly its uses are distributed across the three functions. A rating of 0 indicates that the word is highly inflexible, with all its occurrences being used for a single function; a rating of 1 indicates that the word is maximally flexible, with its occurrences evenly distributed across the three functions. By quantifying the flexibility of each word in this way, it then becomes possible to look for statistical correlations between the flexibility of a word and other factors, such as those addressed by the other two research questions. It also enables us to answer the question of just how pervasive flexibility is in the two languages.

R2, "Is there a correlation between degree of lexical flexibility for a word and frequency (or corpus dispersion)?", uses the flexibility ratings calculated in R1 to consider whether the flexibility of a word correlates with either its overall frequency or with its corpus dispersion. *Corpus dispersion* refers to how evenly/regularly the word appears in a corpus, a measure which is thought to more accurately capture the notion of frequency of exposure (Gries 2008;

forthcoming). This question has three motivations: First, some researchers have claimed or implied that all words may exhibit flexibility if you examine enough tokens of the word (Mosel & Hovdhaugen 1992: 77). If true, this would lend some empirical support to the claim that all words are to some degree flexible, or perhaps even acategorial. Second, higher-frequency words often preserve irregular or atypical forms or functions (Bybee 2007: Ch. 13), such that words with higher frequencies might be more likely to retain their non-prototypical, flexible uses. Third, the fact that a word is flexible means that there is a wider range of constructions it can appear in. This could reasonably result in a higher overall frequency for flexible words. Each of these potential factors invite inquiry into the relationship between frequency and flexibility.

R3, "How do the semantic properties of words pattern with respect to their flexibility?", is investigated using a mix of quantitative and qualitative methods. Unlike the other two research questions, which are intended to capture the extent of flexibility in and across languages, R3 is an inquiry into the semantic *behavior* of flexible (and inflexible) words. This research question is directly motivated by Croft's (1991; 2000; 2001b; forthcoming) typological markedness theory of lexical categories, which claims among other things that words used in non-prototypical functions (for example, a property word being used to refer, as a noun) will always show a semantic shift in the direction of the meaning typically associated with that function. So, if a property word is used to refer, its meaning should be more object-like than property-like; that is, it should mean something like 'an entity with the property X' rather than 'the abstract property X'. Croft's (1991) seminal work in this area provides strong empirical evidence for this semantic markedness principle, but is nonetheless somewhat preliminary. Croft himself has in various places implored linguists to investigate the lexical semantics of these functional shifts further (Croft 2005: 440; Croft & van Lier 2012: 70), but as yet little research has responded to this call (though see Rogers [2016] and Mithun [2017]). Investigating the semantic patterns that appear in cases of lexical flexibility is therefore another contribution of this thesis, addressed by question R3.

The preceding notes are simply a high-level summary of the principal research questions investigated in this thesis. A complete description of the methods used in answering each question is given in Chapter 3.

This study aims to be framework neutral in the sense of Haspelmath (2010b). Its findings should be interpretable and of interest to researchers working in a range of linguistic theories and with different approaches to lexical categories. As mentioned in §1.2, the results of this study do not depend on whether one analyzes lexical flexibility as polycategoriality, conversion, or something else. While my own perspective on language is decidedly functional, this is of little relevance to how I coded the data, the procedures for which are described in detail in Chapter 3. The relevant factors in this study are operationalized in a theory-neutral way (to the extent such a thing is possible), and I expect that my coding decisions for individual data points will be found largely unobjectionable. Thus some researchers may choose to view this study as an empirical investigation into the frequency of conversion in languages rather frequency or degree of lexical flexibility.

While the methods used in this study are compatible with a variety of theories of lexical flexibility, I nonetheless argue in Chapter 2 for a cognitively-informed, typological-constructional theory of word classes and flexible words. It is cognitively-informed in that it treats mental categories as *prototypal*, and recognizes the existence of various prototype effects in language. I also adopt a Radical Construction Grammar approach (Croft 2001b) in which the basic categories in language are *constructions* rather than *parts of speech* (see also [Langacker 1987; Fillmore, Kay & O'Connor 1988; Goldberg 1995; 2006]). In construction grammar, language is viewed as a structured taxonomic network of constructions, whether those constructions are *substantive* (like words and morphemes) or *schematic* (like grammatical relations).

Several principles guided the choice of data used for this study. First, a self-imposed requirement for this project is that of empirical accountability and replicability. It should be possible for other researchers to apply the measure of lexical flexibility defined in Chapter 3 to new corpora, or to replicate the results of the present study on the existing dataset. As

such, I only used data that were publicly available and, if possible, open access. Second, since the aim of this study is to investigate lexical flexibility in actual language *use*, I rely solely on naturalistic data from spoken texts. This has the additional advantage of abetting comparison between other, less well documented languages, since the majority of corpora of minority languages consist mainly of spoken texts. Third, I sought to examine data from languages that have featured prominently in discussions of lexical flexibility in the literature, with the intention of offering a more expansive empirical foundation for future discussions. With these principles in mind, I chose to focus this study on English and Nuuchahnulth.

English has at various times been described as both a highly flexible language with fluid category membership (Crystal 1967: 47–48; Vonen 1994; Farrell 2001: 111; Cannon 1985) and a fairly rigid language with clearly-delineated categories (Rijkhoff 2007: 710; Schachter & Shopen 2007: 4, 11, 12; Velupillai 2012: 122, 126). It is used as a point of comparison for nearly every discussion of lexical flexibility, but we do not have a clear idea of just how flexible English words are. Its inclusion in this study is therefore well justified. The data for English are from the Open American National Corpus (OANC), a 15-million word corpus of American English comprising numerous genres of both spoken and written data, all of which is open access (Ide & Suderman 2005). This study uses just the spoken portion of the corpus, consisting of approximately 3.2 million words, which is itself composed of two distinct subcorpora—the Charlotte Narrative & Conversation Collection (or simply "the Charlotte corpus") and the Switchboard Corpus.

Nuuchahnulth (formerly referred to in the literature as Nootka) is a Wakashan language presently spoken by a hundred or so people on and around Vancouver Island, British Columbia, in the Pacific Northwest. Nuuchahnulth, together with the other members of the Wakashan family (especially Makah and Kwak'wala / Kwakiutl) is one of the widely discussed languages in the literature on lexical flexibility (Swadesh 1939b; Jacobsen 1979; Braithwaite 2015). This is due largely to the following examples of flexible words from Swadesh (1939b).

Nuuchahnulth (Wakashan > Southern Wakashan)

(8) a. qo·ʔas-ma ʔi·ḥ-ʔi
man-3SG.IND large-DEF
'The large one is a man.' (Swadesh 1939b: 78)

b. ʔi·ḥ-ma ʔo·ʔas-ʔi
large-3SG.IND man-DEF
'The man is large.' (Swadesh 1939b: 78)

(9) a. mamo·k-ma ʔo·ʔas-ʔi
work-3SG.IND man-DEF
'The man is working.' (Swadesh 1939b: 78)

b. ʔo·ʔas-ma mamo·k-ʔi
man-3SG.IND work-DEF
'The working one is a man.' (Swadesh 1939b: 78)

Hardly a single typological survey of lexical categories or study of lexical flexibility has failed to include these examples since. Yet we still do not know how representative these examples are of Nuuchahnulth in general. What is more, lexical flexibility is an areal feature of the entire Pacific Northwest. The nearby Chimakuan, Chinookan, Coosan, Sahaptian, Salishan, and Tsimshianic families as well as the isolate Kutenai each exhibit lexical flexibility to a presumably strong degree, since they have caught the attention of so many researchers in this regard (Chimakuan: Andrade [1933: 179]; Chinookan: **DuncanSwitzlerZenk2023**; Coosan: Frachtenberg [1922: 318]; Sahaptian: Wetzer [1996: 142]; Salishan: Kuipers [1968], Hébert [1983], Kinkade [1983], van Eijk & Hess [1986], Jelinek & Demers [1994], Mattina [1996], Beck [2002: §4.1.1], Montler [2003], Beck [2013], Davis, Gillon & Matthewson [2014]; Tsimshianic: Davis, Gillon & Matthewson [2014]; Kutenai: Morgan [1991]). Again, we do not actually know whether this literature is truly representative of the pervasiveness of the phenomenon, or whether its "exotic" nature as compared to Indo-European languages has simply garnered undue attention to the topic in this geographic region. Nuuchahnulth, being the most discussed of these languages, is therefore nearly obligatory to include in a study such as this one.

The data used for the investigation of Nuuchahnulth come from a corpus of texts collected and edited by Toshihide Nakayama and published in Little (2003) and Louie (2003). The corpus

consists of 24 texts dictated by speakers Caroline Little and George Louie, containing 2,081 utterances and 8,366 tokens (comprising 4,216 types). The texts cover a variety of genres, including procedural texts, personal narratives, and traditional stories. I manually retyped these texts as scription files for analysis. Scription is a simple text format for representing interlinear glosses in a way that is both familiar to linguists and computationally parseable (Hieber 2020a). The resulting digitally-searchable corpus is available on GitHub at `https://github.com/dwhieb/Nuuchahnulth`.

Other languages that would have been obvious choices for inclusion in this study are Riau Indonesian (Austronesian > Malayo-Polynesian) (Gil 1994), Mundari (Evans & Osada 2005; Hengeveld & Rijkhoff 2005), Classical Nahuatl (Uto-Aztecan) (Launey 1994; 2004), and Central Alaskan Yup'ik (Eskimo-Aleut > Yupik) (Thalbitzer 1922; Sadock 1999; Mithun 2017). Each of these has generated contested claims about their flexibility and the existence of flexibility more generally. However, practicalities have limited me to examining just English and Nuuchahnulth for the time being. I leave investigations of other languages to future research and researchers.

Both the English and Nuuchahnulth corpora were converted to the Data Format for Digital Linguistics (DaFoDiL) (a JSON format for representing linguistic data; Hieber [2020b]) for tagging and scripting purposes. This made it possible to use the Digital Linguistics (DLx) ecosystem of tools and software to more quickly tag and analyze the data. More information about Digital Linguistics may be found at `https://digitallinguistics.io`.

All of the datasets, scripts, and source files for this thesis are publicly available on GitHub at `https://github.com/dwhieb/dissertation`.

Turning now to results:

Regarding R1, "How flexible are words in English and Nuuchahnulth?", I find that English and Nuuchahnulth differ significantly not only in their overall degree of flexibility, but also in how that flexibility is realized. In English, the majority of words surveyed are flexible, but only to a small degree. Most lexical words of English can be used as nouns, verbs, or adjectives,

but there is a strong tendency for each word to be used for primarily one function. English thus shows a consistent but somewhat marginal degree of flexibility. In contrast, most words in Nuuchahnulth are highly flexible, but primarily along the noun-verb axis; Nuuchahnulth words are very freely used as both nouns and verbs, but only infrequently used as adjectives. Nuuchahnulth thus shows a consistently high degree of flexibility, but primarily in just one dimension.

For R2, "Is there a correlation between degree of lexical flexibility for a word and frequency (or corpus dispersion)?", I find that higher frequency words are more flexible than lower frequency words, but that the effect is very small. The same facts hold when comparing degree of lexical flexibility with corpus dispersion. Words that are more evenly dispersed in a corpus have a slight tendency to be more flexible than those that are less evenly dispersed. These findings suggest that the degree of flexibility exhibited by a word does depend in part on how regularly speakers use it.

Lastly, R3 asks "How do the semantic properties of words pattern with respect to their flexibility?". With respect to Nuuchahnulth, I find that property words, especially numerals and quantifiers, are the most flexible semantic class of words. Nearly all of the most flexible words denote property concepts. Deictic expressions such as *this*, *that*, *here*, *there* also rank very highly in their flexibility. I also find that there are strong correlations between morphologically marked aspect (durative, continuative, inceptive, etc.) and discourse function. In Nuuchahnulth, aspect markers may be used with either predicates or referents; they are not an exclusively verbal category. However, I find that the presence of any aspect marker does correlate strongly with predication, lending additional empirical evidence to Hopper & Thompson's (1984) claim that items used in their prototypical function will show the inflectional behaviors typical of that function. The momentaneous and telic aspect markers are the only ones in Nuuchahnulth which show any sort of tendency towards use with referents, while the durative was the only aspect marker to show any sort of tendency towards use with modifiers. Since aspect is a grammatical category that expresses how speakers construe the

temporal structure of an event, these data suggest that flexibility has a great deal to do with how speakers conceptualize or construe words—as an action, object, or property—as has been suggested by Croft (1991: 99; 2001b: 104).

Nuuchahnulth also has a definite suffix *-ʔiː* used with referents. Nakayama (2001: 48) states that this suffix is used with action words being construed as objects. This observation suggests that the definite suffix may have a clarifying function, appearing whenever an action word is used for the atypical role of reference (as predicted by Croft's structural coding hypothesis; see §2.4 for more details). One hypothesis that arises from applying typological markedness theory to Nuuchahnulth is that aspect markers which correspond to more object-like construals of a word (durative, telic, momentaneous) are more likely to be marked with the definite suffix. This turns out to be true, but only trivially so—only a tiny percentage (7.98%) of words with definite markers also had aspect markers. However, this leads to the far more interesting observation that the definite marker and the aspect markers in Nuuchahnulth are *almost* entirely mutually exclusive. They only rarely co-occur. These facts demonstrate that even in a language with rampant flexibility, as this study shows Nuuchahnulth to be, flexibility is nonetheless bound by universal typological constraints.

To summarize, this thesis makes contributions in several areas. The first is methodological: this thesis lays out a procedure for quantifying lexical flexibility for individual words in a corpus that can be replicated for other languages and corpora (Chapter 3). The second is empirical and descriptive: I describe the extent of lexical flexibility and the manner in which it operates in English and Nuuchahnulth (Chapter 4). The final contribution is analytical and theoretical: I argue that the data and statistical analysis presented in this thesis support Croft's typological markedness theory of word classes, in which lexical categories such as noun, verb, and adjective are not in fact categories of particular languages as has been historically assumed, but instead are emergent patterns that arise from how speakers use object, action, and property words for different functions in discourse (reference, predication, and modification). Words used for functions that are not prototypical of their meaning *tend*

to be more marked (morphologically, behaviorally, semantically, and/or frequentially) than prototypical uses, but this is not an absolute universal. Lexical flexibility is the natural and expected result of the fact that these non-prototypical uses are *not* always *morphologically* marked, even when they are marked in other ways (Chapter 5).

The remainder of this thesis is organized as follows: Chapter 2: Background summarizes previous definitions of lexical flexibility and discusses their shortcomings. I propose an alternative, functionally-oriented definition that is consistent with cognitive and typological approaches to word classes instead. Chapter 3: Data & Methods describes in detail how the data were coded and analyzed for each of the major research questions (and contributing subquestions) in this study. I discuss factors that influenced how the data were coded, and outline the various coding decisions that were made. I present and explain a measure of corpus dispersion that is used partly in place of, and partly as a complement to, raw frequencies of words. Lastly, I set forth a procedure for operationalizing and quantifying lexical flexibility in a crosslinguistically comparable way. Chapter 4: Results presents the empirical findings from this study. I demonstrate how the methodological techniques from Chapter 3 are applied to individual words, and then present aggregated views of the data for English and Nuuchahnulth respectively. Chapter 5: Discussion & Conclusion considers the implications of the results in Chapter 4 for theories of lexical categories. I argue that the data support a typological-universal theory of word classes, and that lexical flexibility should be viewed as a natural result of the cognitive and diachronic processes at work in language, rather than as an exceptional phenomenon. I conclude by discussing some limitations of the present study and avenues for future research, followed by closing remarks.

Chapter 2

Background

The focus of this chapter is to explain the concept of lexical flexibility, consider its criticisms, and offer a more robust, functionally-grounded definition instead. I first briefly describe how flexible approaches to lexical categories developed as a response to weaknesses in traditional theories of parts of speech. I then survey the landmark studies and important findings on lexical flexibility, along with criticisms of this research. Following that, I present the typological markedness theory of lexical categories, which states that lexical categories are merely emergent markedness patterns regarding how different semantic classes of words are used for different discourse functions. I conclude by offering a revised formulation of lexical flexibility which is in line with typological markedness theory.

2.1 Introduction: Approaches to lexical flexibility

The field of linguistics as a whole, and the subfield of typology in particular, is undergoing a radical shift in how we understand lexical categories, along primarily two dimensions. The first dimension is our understanding of what lexical categories are a property *of*. Early researchers viewed categories as universal properties of both language generally and specific languages. I call this the *universalist* position. After Boas, many researchers then came to view categories as language-specific, with patterned similarities across languages. I call this the *relativist* approach. Most recently, some researchers view categories as typological patterns rather than properties of any particular language. This is the *typological* position, and

the one I adopt here.

The second dimension of historical change in linguistic theories of categories is in the *nature* of the categories themselves. In the Classical tradition, categories were thought to be categorical and well-defined by a set of necessary and sufficient conditions (in the tradition of Aristotle). After the cognitive turn in the 1960s and 1970s, many linguists came to view categories as prototypal, with some members of a category being more central, or better exemplars, than others. Cognitive research into the nature of idioms then led to the development of construction grammar, which sees language as consisting of a network of constructions rather than monolithic categories. I adopt a constructional approach to categories in this thesis.

These theoretical paradigm shifts are summarized in (10). At each stage of development, there has not been a wholesale displacement of previous theories. There are still many who regard word classes as universal and categorical, and the typological-constructional approach is still nascent.

(10) a. universal > language-specific > typological

b. categorical > prototypal > constructional

Section 2.2 gives a synopsis of these theoretical positions and shows how research on lexical flexibility developed in recognition of the shortcomings of traditional approaches. Section 2.3 summarizes the key concepts and findings that have arisen from the research on lexical flexibility. Such research, however, is not without its own shortcomings. Section 2.3 also presents the main criticisms that have been leveled against flexible analyses of word classes. Section 2.4 then presents an alternate, functionally-oriented approach—the typological-constructional perspective. The final section of this chapter (§2.5) then applies this functional perspective to formulate an improved definition of lexical flexibility.

2.2 Traditional approaches

This section is a necessarily brief history of approaches to lexical categories up until the cognitive turn of the 1980s. It covers the universalist position that developed in the Classical tradition, the relativist position that developed as a result of Boas' cultural relativism, and the structuralist (or "distributionalist") position that developed in the tradition of Saussure. Depending on how one understands and applies these different perspectives, none of them are mutually exclusive. It is especially common for linguists to simultaneously hold that lexical categories must be identified on the basis of language-internal evidence alone (the relativist position) and that lexical categories are universal in some sense or another (the universalist position).

2.2.1 Universalism

Historically and still presently, many researchers assumed that a small set of lexical categories are basic and universal to all languages (Bolinger & Sears 1981: 81; Croft 1991: 2; Payne 1997: 32; Stassen 2011: 95). The set typically consists of some variation of the following: Noun, Verb, Adjective, Adverb, Pronoun, Adposition, Conjunction, Numeral, and Interjection (Haspelmath 2001: 16538). This set has its origins in the *Τέχνη Γραμματική* / *Tékhnē Grammatiké* ('The art of grammar') of the the 2nd century B.C.E. grammarian Dionysius Thrax. The *Tékhnē* synthesizes the work of Dionysius' predecessors, describing eight parts of speech for Classical Greek. These parts of speech were based largely on morphological (especially inflectional) criteria (Rauh 2010: 17–20). The *Tékhnē* was then translated and its model applied to Latin in the *Ars Grammatica* of Remnius Palaemon. The *Ars Grammatica* initiated a tradition wherein the languages of Europe and eventually the world (e.g. Mandarin [McDonald 2013]) were described using both Dionysius' categories (with occasionally additions / subtractions) as well as his method of identifying those categories on the basis of morphological criteria (Rauh 2010: 20).

Implicit in the Classical method is the assumption that lexical categories are universal in the sense of being instantiated in all languages. However, as European scholars began to encounter non- languages (or even non- languages) in both Europe and abroad, this assumption was challenged, as early as the first grammatical descriptions of Irish in the 7th century. At first, these languages either had Classical grammar imposed upon them or were deemed grammatically deficient (Suárez 1983: 3). Nonetheless, missionary linguists in the early colonial era were indeed aware of the significant grammatical differences between these languages and Latin, and made their best attempts at describing them (Suárez 1983: 3–4). It is also important to realize that the project of describing the languages in the Americas and other zones of colonial influence was partially contemporaneous with the publication of the first grammars of the vernacular languages of Europe, as illustrated in Figure 2.1 (the data for which are shown in Table 2.1). Between 1524 and 1572, over 100 catechisms, manuals for confession, collections of sermons, grammars, and vocabularies were written in or about ten languages within the Viceroyalty of New Spain alone (an area smaller than present-day Mexico), mostly by Spanish Franciscan and Jesuit missionaries (Suárez 1983: 2). The task of converting the indigenous peoples to Christianity via the medium of their own languages was so important to the Spanish crown that the first bishop of Mexico, Francisco de Zumárraga, brought a printing press to Mexico in 1534 (just 15 years after the arrival of the first Spaniards in Mexico in 1519). The first book printed in Mexico was a Spanish-Nahuatl catechism by Alonso de Molina (Suárez 1983: 2). All this is merely to illustrate that language scholars in the colonial era were wrestling with the lexical categories of non-Indo-European languages—and therefore aware of the challenges these languages posed to Classical theories—at a very early stage.

Table 2.1: Some first grammatical descriptions of European vs. American languages

Language	Year	Title	Author
Irish	600s	*Auraicept na n-Éces* 'The scholars' primer'	Longarad

Table 2.1: Some first grammatical descriptions of European vs. American languages

Language	Year	Title	Author
Occitan	1327	*Leys d'amors* 'Laws of love'	Guilhèm Molinièr
Welsh	1382–1410	*Llyfr Coch Hergest* 'Red book of Hergest'	unknown
Tuscan	1437–1441	*Grammatica della lingua toscana* 'Grammar of the Tuscan language'	Leon Battista Alberti
Castilian	1492	*Gramática de la lengua castellana* 'Grammar of the Castilian language'	Antonio de Nebrija
French	1530	*L'Éclaircissement de la langue francoyse* 'Explication of the French language'	John Palsgrave
German	1534	*Ein Teutsche Grammatica* 'A German grammar'	Valentin Ickelsamer
Basque	1545	*Linguæ Vasconum Primitiæ* 'First fruits of the Basque language'	Bernard Etxepare
Totonac	1539–1554	*Arte de la lengua totonaca* 'Grammar of the Totonac language'	Andrés de Olmos
Nahuatl	1547	*Arte para aprender la lengua mexicana* 'Grammar for learning the Mexican language'	Andrés de Olmos
Tarascan	1558	*Arte de la lengua tarasca de Michoacán* 'Grammar of the Tarascan language of Michoacán'	Maturino Gilberti
Dutch	1559	*Den schat der Duytsscher Talen* 'The treasure of the Dutch language'	John III van de Werve
Quechua	1560	*Grammatica o arte de la lengua general de los Indios de los Reynos del Peru* 'Grammar or Art of the General Language of the Indians of the Royalty of Peru'	Domingo de Santo Tomás
Tzeltal Maya	1571	*Ars Tzeldaica* 'Tzeltal Grammar'	Fray Domingo de Hara
Zapotec	1578	*Arte en lengua Zapoteca* 'Grammar in the Zapotec language'	Juan de Córdova
English	1586	*Pamphlet for Grammar*	William Bullokar

Table 2.1: Some first grammatical descriptions of European vs. American languages

Language	Year	Title	Author
Mixtec	1593	*Arte de lengua Mixteca* 'Grammar of the Mixtec language'	Antonio de los Reyes
Timucua	1614	*Gramatica de la lengua Timuquana de Florida* 'Grammar of the Timucua language of Florida'	Francisco Pareja
Narragansett	1643	*A key into the language of America*	Roger Williams

As documentary linguistics turned its attention to North American (as opposed to Mesoamerican) languages, lexical flexibility in particular became a more prominent issue. In fact, even the first comprehensive survey of North American languages contains an entire section on "Conversion of nouns into verbs" (Gallatin 1836: 174–177), in which Gallatin depicts lexical flexibility as a rampant feature of all languages on the continent:

> It is the substantive [i.e. copula / auxiliary] verb which we [speakers of Indo-European languages] conjugate; whilst the [Native American] conjugates what we call the adjective and even the noun itself, in the same manner as [s/he] does other intransitive verbs. [...] I believe it must appear sufficiently obvious, that this general if not universal character of the [Native American] languages, the conversion into verbs and the conjugation, through all the persons, tense, and moods, of almost all the adjectives and of every noun which, without a palpable absurdity, is suspectible of it, is entirely due to the absence of the substantive verb. (Gallatin 1836: 175–176)

As evidenced by the above passage, increasing familiarity with non-Indo-European languages prompted some writers to abandon the universalist commitment. However, categorial universalism is still a widely-held position today, either in the sense of a) being universally instantiated in all languages (commonly assumed by most generative frameworks; although see Culicover [1999]), or b) being available to all languages, but only instantiated in some (sometimes called the "smörgåsbord" or "grab bag" approach, as exemplified by Dixon's Basic Linguistic Theory framework [2010: 9, 11, 14, 27, 50; 2011: 26]; Hieber [2013: 298]; Croft [2001b: 10]).

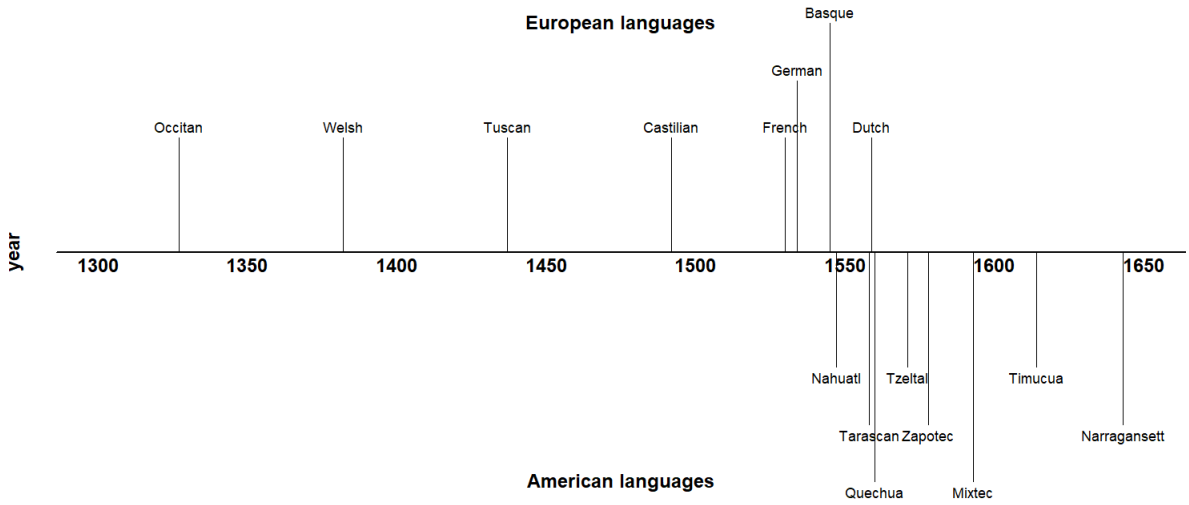

Figure 2.1: Approximate date of some of the first grammatical descriptions of European vs. American languages

2.2.2 Relativism

American ethnographers in the tradition of Franz Boas questioned the univeralist assumption in a programmatic and comprehensive way. Writing on grammatical categories, Boas states, "Grammarians who have studied the languages of Europe and western Asia have developed a system of categories which we are inclined to look for in every language" (Boas 1911: 35). He concludes that this endeavor is a folly, and that "in a discussion of the characteristics of various languages **different fundamental categories** will be found" (Boas 1911: 35). Boas' students all adopted his grammatical relativism, and it became a foundational principle of the American linguistics tradition. His student Edward Sapir, writing on lexical categories specifically, makes one of the best-known and strongest statements of this position in his influential textbook *Language*: "[N]o logical scheme of the parts of speech—their number, nature, and necessary confines—is of the slightest interest to the linguist. Each language has its own scheme. Everything depends on the formal demarcations which it recognizes." (Sapir 1921: 125).

Many linguists today hold to Boas' grammatical relativism in some fashion or another.

Textbooks and typological surveys commonly state that languages have varying numbers of lexical categories, though usually with the caveat that all languages seem to differentiate at least noun and noun (e.g. Velupillai 2012: §6.2). Some researchers, especially those working in typology, argue that linguists are still not rigorous *enough* in their application of grammatical relativism; they criticize certain kinds of crosslinguistic comparisons for imposing the categories of one language onto another (Croft 2001b; Gil 2001; Haspelmath 2010a; 2012; LaPolla 2016). This position is discussed further in §2.4.

2.2.3 Structuralism

Developing alongside the early anthropological linguistics of Boas was the linguistic structuralism of Ferdinand de Saussure. His work informed both the Prague school under Nikolay Trubetzkoy and Roman Jakobson, and the distributional method of Leonard Bloomfield. The term *structuralism* has any number of uses (P. Matthews 2001: Ch. 1); here I refer to the idea that "language is a [...] self-contained, self-regulating system, whose elements are defined by their relationship to other elements" (P. H. Matthews 2014: 383). In particular, I am referring to the positivistic flavor of structuralism as practiced by Bloomfield, which focused on the structural relations between elements and establishing a set of rigorous scientific discovery procedures for linguistic structures (Bloomfield 1933). Bloomfield saw lexical categories as something to be empirically discovered in the different syntactic distributions of words, rather than imposed on a language a priori (Rauh 2010: 33). Zellig Harris later refined and expanded on this methodology (Harris 1951), which in turn was incorporated into Noam Chomsky's ealy Phrase Structure Grammar.

The signature methodological feature of this form of structuralism is the *distributional method*, a procedure for defining categories in terms of the set of contexts in which its words can appear—that is, their distributions (Harris 1951: 5; Croft 2001b: 11). As an illustration of distributional analysis applied to lexical categories, Croft (1991: 11–12) considers the distributions of the English words *cold*, *happy*, *dance*, and *sing* in two constructions: in the Predicate

construction after *be*, and in the 3rd Person Singular Present Tense (*-s*) construction. Example data are shown below.

(11) English (Indo-European > Germanic)

a. i. Jack is cold.
ii. * Jack colds.

b. i. Jack is happy.
ii. * Jack happies.

c. i. * Jack is dance.
ii. Jack dances.

d. i. * Jack is sing.
ii. Jack sings.

We can see that *cold* and *happy* have the same distributions in these tests (both may appear in the Predicate construction but not the Person-Tense inflection construction), while *dance* and *sing* have the same distribution (the inverse situation as *cold* and *happy*). The results of these two distributional tests are summarized in Table 2.2.

Table 2.2: Distribution of English Verbs and Adjectives (adapted from Croft [2001b: 12])

	Predicate Construction	Inflectional Construction
Adjective: *cold*, *happy*, etc.	✓	✘
Verb: *sing*, *dance*, etc.	✘	✓

As applied in practice, however, the distributional method suffers from one serious drawback when used to argue for large, traditional categories like noun, verb, and adjective: distributional tests yield conflicting and overlapping results. Perhaps no two lexical items behave the same in every distributional test. Each new test that is introduced therefore partitions the lexicon into smaller and smaller classes. This fact has been demonstrated empirically for English temporal nouns (Crystal 1967: 54), Russian numerals (Corbett 1978), and French verbs (Gross 1979). Distributional tables like that in Table 2.2 from each of these studies are reproduced in Table 2.5, Table 2.4, and Table 2.3 respectively. It is clear from these studies

that distributional analysis does *not* lead to large, unified categories like noun, verb, and adjective, but rather a myriad of small constructions (Crystal 1967: 27; Croft 2005: 434). Each distributional test is in fact its own construction (Croft 2005: 436). This fact is the motivation underlying constructional approaches to language.

Many scholars nonetheless choose to retain lexical categories as a necessary component of their linguistic theories or descriptions, at the expense of consistent application of the distributional method. Rather than considering all possible distributional contexts for a word, these scholars instead treat certain constructions as definitional of the category. Other distributional tests which yield cross-cutting results are either ignored, or treated as evidence of subcategories instead of categories. Many researchers even prefer the term *syntactic categories* over *lexical categories* for this reason, focusing on just the syntactic evidence for categories (Baker 2003; Rauh 2010). A severe methodological problem for this approach is that there are no generally agreed-upon principles for determining which distributional tests should be considered definitional. In this regard, Schachter & Shopen (2007: 4) note, "there may be considerable arbitrariness in the identification of distinct parts of speech rather than subclasses" (see also Crystal [1967]). Different scholars choose or prioritize different kinds of evidence for lexical categories over others on the basis of their theoretical commitments. This is the reason, as stated in Section 1.1, that disagreements about the existence of particular lexical categories in particular languages are typically *not* about the empirical facts. The results of a given distributional analysis are not usually controversial; the choice of distributional tests used to support one's analysis are. Unsurprisingly, then, debates over how to analyze lexical categories in various languages have been largely unproductive and unresolved (Croft 2005: 435). The problem only worsens when scholars attempt to apply the same criteria across languages. Distributions of words with similar meanings vary drastically across languages (Croft 2001b: §1.4.1).

The real methodological problem here is *not* that we have yet to ascertain the correct principles for selecting the right distributional tests. The problem is being selective regard-

	in a *N* or two	in that *N*	in the $N_{sg.}$ (no postmodification) [65]	in a *N* (no postmodification) [65]	in ø $N_{pl.}$ (no postmodification) [65]	in ø $N_{sg.}$	ø $N_{pl.}$	on the $N_{sg.}$	on a $N_{sg.}$ (no postmodification) [65]	on ø $N_{pl.}$ (no postmodification) [65]	on ø $N_{sg.}$	at that *N*	at the $N_{sg.}$	at ø $N_{sg.}$
afternoon	+	+	+	+	−	−	+	+	+	+	−	−	−	−
evening	+	+	+	+	−	−	+	+	?+	?+	−	−	−	−
weekend	+	+	?+	+	−	−	+	+	?+	+	−	+	+	−
night	+	+	+	?+	−	−	?−	+	−	− [66]	−	−	−	+
morning	+	+	+	+	−	−	+	+	−	− [66]	−	−	−	−
Monday...	+	−	−	−	−	−	+	+	+	+	+	−	−	−
January...	?+	+	+	+	−	+	−	−	−	−	−	−	−	−
hour	+	+	+	+	?−	−	−	+	−	−	−	+	+	−
minute	+	+	−	+	+	−	−	+	−	−	−	+	+	−
second	+	+	−	+	+	−	−	+	−	−	−	+	+	−
day	+	+	+	+	−	−	−	+	−	− [66]	−	−	−	−
summer	?+	+	+	?−	?−	+	?+	−	−	−	−	−	−	?+
winter	?+	+	+	?−	?−	+	?+	−	−	−	−	−	−	?+
spring	?+	+	+	?−	−	+	−	−	−	−	−	−	−	?+
autumn	?+	+	+	?−	−	+	−	−	−	−	−	−	−	?+
month	+	+	+	+	+	−	−	−	−	−	−	−	−	−
week	+	+	+	+	+	−	−	−	−	−	−	−	−	−
year	+	+	+	+	+	−	−	−	−	−	−	−	−	−
decade	+	+	−	+	?+	−	−	−	−	−	−	−	−	−
century	+	+	−	+	?−	−	−	−	−	−	−	−	−	−
fortnight	+	+	+	+	−	−	−	−	−	−	−	−	−	−
instant	+	?+	−	+	−	−	−	−	−	−	−	+	−	−
moment	+	?+	−	+	−	−	−	−	−	−	−	+	−	−
lifetime	−	?+	−	+	−	−	−	−	−	−	−	−	−	−
daytime	−	−	+	−	−	+	−	−	−	−	−	−	−	−
nighttime	−	−	+	−	−	+	−	−	−	−	−	−	−	−

Table 2.3: distributional analysis of English temporal nouns (Crystal 1967: 54)

ing which tests to apply in the first place. If we take the distributional method seriously, then we must apply it consistently, without ignoring distributional evidence that contradicts our theoretical or pretheoretical assumptions. To do otherwise is a kind of *methodological*

		odin 1	*dva* 2	*tri* 3	*pjat'* 5	*sto* 100	*tysjača* 1,000	*million* 1,000,000
	1. Agrees with N in syntactic number	+	−	−	−	−	−	−
	2. Agrees in case throughout	+	−	−	−	−	−	−
	3. Agrees in gender	+	(+)	−	−	−	−	−
	4. Marks animacy	+	+	+	−	−	−	−
not the case that	5. Has own plural	+	+	+	+	(−)	−	−
not the case that	6. Takes agreeing determiner	+	+	+	+	+	−	−
not the case that	7. Takes N in genitive plural throughout	+	+	+	+	+	±	−

Table 2.4: distributional analysis of Russian numerals (Corbett 1978: 359)

opportunism (Croft 2001b: 30, 41).

Other scholars treat flexible words as members of *hybrid* or *mixed* categories simultaneously possessing properties of more than one part of speech (Lois et al. 2017: 149; Malouf 1999; Nikolaeva & Spencer 2020). Adjectives are frequently described as a hybrid category (Wetzer 1996; Stassen 1997: 343; Pustet 2003: 13–16; Genetti & Hildebrandt 2004: 95; van Lier 2017), as are participles (Hopper & Thompson 1984: 704) and gerunds (Denison 2001). Lois et al. (2017: 149) distinguish hybridity from polycategoriality, stating that polycategoriality applies to roots or stems, while hybridity is a matter of the syntactic context that a word appears in.

An analysis couched in mixed categories does not avoid the problem of methodological opportunism, however. The existence of a mixed category implies that there are other, more basic categories that the mixed category is a hybrid of. Hybrid models of parts of speech merely exacerbate the distributional problem. There is however a sense in which viewing minor lexical categories as mixed categories is useful, and that is when one views lexical categories as typological markedness patterns arising from combinations of the semantic classes of object, action, or property words with the discourse functions of reference, predication,

il V Ω		Auxiliaire avoir	Auxiliaire être	N_0 est V_{pp} Ω	Compléments directs ou indirects														Comp. indirect						
					N_0 V Prép N_1		Complétives						Noms						N_0 V Prép N_2		Noms				N_0 V V^0 Ω
							que P	que Psubj	[pc z.]	V^2 Ω	ce (ci + la)	Pron ppv	N_{hum}	ppv	N_{-hum}	le fait Qu P	ppv			N_{hum}	ppv	N_{-hum}	ppv	
+	s'agir	—	+	—	+	de	—	+	+	+	+	—	+	—	+	+	—	—	pour	+	—	—	—	—
+	apparaître	—	+	—	+	0	+	—	—	—	+	+	—	—	+	—	+	—	à	+	+	—	—	—
+	apparoir	—	—	—	—	0	—	+	—	—	—	—	—	—	—	—	—	—	0	—	—	—	—	—
+	s'avérer	—	+	—	+	0	+	—	—	—	+	+	—	—	+	—	+	—	à	+	—	—	+	+
+	y avoir avantage	+	—	—	+	à	—	+	—	+	+	—	—	—	—	—	—	+	pour	+	—	—	—	—
+	y avoir lieu	+	—	—	+	de	—	+	+	+	—	—	—	—	—	—	—	—	pour	+	—	—	—	—
+	n'empêcher	+	—	—	+	0	+	—	—	—	—	—	—	—	—	—	—	—	0	—	—	—	—	—
+	être besoin	+	—	—	—	de	—	+	+	+	+	+	—	—	+	—	+	—	pour	+	—	+	—	—
+	être l'heure	+	—	—	—	de	—	+	+	+	+	+	—	—	+	—	+	—	pour	+	—	—	—	—
+	être question	+	—	—	+	de	—	+	+	+	+	+	+	—	+	+	+	—	pour	+	—	+	—	—
+	être temps	+	—	—	+	de	—	+	+	+	+	+	—	—	+	—	+	—	pour	+	+	—	—	—
+	faire bon	+	—	—	+	0	—	—	—	+	—	—	—	—	—	—	—	—	pour	+	—	—	—	—
+	falloir	+	—	—	+	0	—	+	—	+	+	+	+	+	+	—	+	—	à	+	+	—	—	—
+	s'en falloir	—	+	—	—	pour	—	+	—	—	—	—	—	—	—	—	—	—	de	—	—	+	—	—
+	paraître	+	—	—	+	0	+	—	—	—	+	+	—	—	+	—	+	—	à	+	+	—	—	+
+	paraître	—	—	—	+	0	+	—	—	—	—	—	—	—	—	—	—	—	0	—	—	—	—	—
+	sembler	+	—	—	+	0	+	—	—	—	+	+	—	—	+	—	+	—	à	+	+	—	—	+
+	souvenir	—	+	—	+	de	+	—	+	+	+	+	+	—	+	+	+	—	à	+	+	—	—	—

Table 2.5: distributional analysis of French verbs (Gross 1979: 860)

and modification. Categories frequently discussed as "mixed" are precisely those combinations which are non-prototypical and therefore more likely to be typologically marked. Section 2.4.2 explains this approach to lexical categories in more detail.

Partly in response to these problems, a growing cadre of linguists in the last 30 years have

adopted one of various *flexible* approaches to word classes. Flexible analyses of word classes come in many flavors, some of which arguably still commit methodological opportunism, and others of which introduce new difficulties. These flexible approaches are reviewed in the following section.

2.3 Flexible approaches

In this section I summarize the key concepts (§2.3.1), findings (§2.3.2), and criticisms (§2.3.2) of lexical flexibility research. Section 2.3.1 surveys the wide variety of definitions and theoretical perspectives on lexical flexibility. This review of the literature reveals that there is very little consensus as to what exactly constitutes "lexical flexibility"; as such, there are numerous alternative terms for the phenomenon. Despite these incongruities, a few important findings do consistently surface across the empirical research. These findings are summarized in Section 2.3.2. Section 2.3.3 then looks at the arguments and evidence that researchers have presented against the notion of lexical flexibility.

2.3.1 Key concepts

It is only a small exaggeration to say that there are as many definitions and terms for what I am here calling "lexical flexibility" as there are scholars who research it. I use the term *lexical flexibility* in this thesis merely because it is the most widely recognized of the cluster of terms that are used, not because it is necessarily the most precise or accurate. My own choice would be *functional expansion*, for reasons discussed below. The analytical or theoretical perspective adopted by each researcher generally determines their choice of terminology. The remainder of this section is devoted to explaining these perspectives in more detail.

Generally speaking, there are two ways to analyze flexible words. The first method assigns flexible words to members of specific categories in a language, whether those language-categories are the canonical four major classes (Noun, Verb, Adjective, Adverb), or a new

large supercategory subsuming multiple discourse functions (e.g. contentives, non-verbs, flexibles), or a smaller subcategory of an existing major lexical category (e.g. adjective verbs, verbonominals). The second method of analysis assumes that words are uncategorized at some level (root, stem, or inflected word), and that words receive their categorial assignment from context. Different researchers posit different mechanisms for how words receive their categorization in context. The traditional approaches to lexical flexibility summarized in Section 2.2 are all instances of the former method of analysis, while the flexible approaches outlined in this section are a mix of categorial and non-categorial analyses.

2.3.1.1 Lexical flexibility

Though awareness of lexical flexibility can be traced back to at least Gallatin (1836: 174–177) if not earlier, the term *lexical flexibility* itself seems to have originated with Hengeveld (1992: Ch. 4). This publication, perhaps because it was the first to assign a technical term to the concept, marks a shift in how scholars frame the concept of lexical flexibility. Previously, the issue was framed in terms of whether particular languages (especially those of the Pacific Northwest) distinguished noun from verb (Kuipers 1968; Jacobsen 1979; Hébert 1983; Kinkade 1983; van Eijk & Hess 1986; Jelinek & Demers 1994). After this point, an increasing number of publications began to ask whether lexemes were *flexible* instead. Though the difference in emphasis seems subtle, this change constitutes a turning point because it fostered an increased interest in lexical flexibility as a grammatical phenomenon in its own right instead of just a problem for traditional categorization schemes.

Hengeveld's 1992: Ch. 4 typology of parts-of-speech systems is a whole-language typology wherein languages are either *specialized*, with one morphosyntactic category for each of the functions of reference (Noun), predication (Verb), referent modification (Adjective), and predicate modification (Adverb[1]), or *non-specialized*. Non-specialized languages deviate from the four-category canon in one of two ways: one part of speech may assume more than one

[1]Note that Hengeveld's typology only includes manner adverbs, not other semantic types of adverbs.

function with no additional morphosyntactic marking, in which case the language is considered *flexible*; or the language may lack a dedicated part of speech for that function entirely and use other, marked constructions instead, in which case the language is considered *rigid*.

Hengeveld gives examples from Dutch and Wambon to illustrate the distinction between rigid and flexible languages. In the Dutch examples in (12), the same word *mooi* is used for both referent modification (12a) and predicate modification (12b), with no overt morphology indicating its function in either case. Wambon on the other hand uses medial verbs for manner expressions, and must take the overt verbalizing suffix *-mo* shown in (13). In Hengeveld's framework, Dutch is a flexible language because one category subsumes both the functions of referent modification and predicate modification, while Wambon is a rigid language because derivational morphology (here, the verbalizing suffix *-mo*) is required to indicate the function of predicate modification.

(12) Dutch (Indo-European > Germanic)

a. een **mooi** kind
INDEF **beautiful** child
'a beautiful child' (Hengeveld 1992: 65)

b. het kind dans-t **mooi**
DEF child dance-3SG.PRES **beautifully**
'the child dances beautifully' (Hengeveld 1992: 65)

(13) Wambon (Trans-New Guinea > Greater Awyu)

jakhov-e **matet-mo** ka-lembo
they-CONN **good-VZR.SS** go-3PL.PAST
'did they travel well?' (de Vries [1989: 49], cited in Hengeveld [1992: 65])

Hengeveld's analysis is of the categorial type discussed at the beginning of Section 2.3.1, specifically the supercategory kind. Each word is assumed to have a category, and new supercategories are introduced for words which have multiple functions: *contentives* for words which perform all four functions, *non-verbs* for words which perform all non-predicating functions, and *modifiers* for words which perform referent modifier and predicate modifier functions.

Hengeveld's parts-of-speech typology and the subsequent research it inspired (Don & van Lier 2013; Hengeveld & Rijkhoff 2005; van Lier 2006; Hengeveld & van Lier 2012; Luuk 2010; van Lier & Rijkhoff 2013; van Lier 2016) constitute important empirical contributions to the study of lexical flexibility. However, Hengeveld's definition of flexible languages and his parts-of-speech typology still rely on large, language-specific categories of the kind that have been problematized by Croft (2001b: §2.2.2) and Croft & van Lier (2012), and are therefore subject to the same difficulties as traditional approaches to parts of speech. However, numerous scholars have since adopted Hengeveld's term *lexical flexibility* to describe cases where words serve more than one discourse function, regardless of their particular theoretical commitments or analysis of flexible words. As a convenient cover term, *lexical flexibility* is now well established.

2.3.1.2 Polycategoriality

Vapnarsky & Veneziano (2017b: 4) introduce the alternative term *polycategoriality* as their preferred characteriziation of flexible words. (The term is also used by Carter (2006), but he does not give a precise definition for it.) While Vapnarsky & Veneziano use this term mostly interchangeably with *lexical flexibility*, there are important differences between the two concepts. Hengeveld's use of *lexical flexibility* is meant to imply the existence of large, flexible supercategories that subsume multiple discourse functions, whereas Vapnarsky & Veneziano are not committed to any particular schema for parts of speech. Central to their notion of polycategoriality is the idea that lexical categories exist, but that "there are lexical forms that are not specified for lexical category (or are not specified fully, or univocally) on some level of representation." (Vapnarsky & Veneziano 2017b: 4). In other words, one word may belong simultaneously to multiple lexical categories. Under this definition, a language could still have all four major lexical categories but nonetheless exhibit rampant polycategoriality; this is not a possibility in Hengeveld's framework. Like Hengeveld, however, Vapnarsky & Veneziano are committed to the existence of large lexical categories in particular languages. Their anal-

ysis is therefore also of the categorial kind discussed at the beginning of Section 2.3.1.

2.3.1.3 Multifunctionality / Polyfunctionality

Another term for our phenomenon of interest, introduced by (van Lier 2012), is *multifunctionality*, in which a single lexeme can have multiple discourse functions. An advantage of this analysis is that it takes no theoretical position on the issue of whether words are categorial or acategorial; it focuses on just their functions. The term *multifunctionality* is meant to stand in contrast with *conversion* or *zero derivation*. van Lier takes conversion to be idiosyncratic and unproductive, producing meanings for words in alternate discourse functions that are not predictable (see §2.3.2.4 and §2.3.3.2 for further discussion). Multifunctionality is also distinct from zero derivation from a common root. Instead, multifunctional words are those whose semantic interpretation is entirely predictable from context, and its uses in different contexts are productive. Its meaning should be *compositional*. For example: when an action word is used in a referring construction its predicted meaning is that of an *action nominalization*, '(the act of) X-ing'; and when an object word is used in a predicate construction its predicted meaning is that of a *predicate nominal*, 'be an X'. Examples of these predictable, compositional meanings for flexible words in Chamorro are shown in (14).

(14) Chamorro (Austronesian > Malayo-Polynesian)

a. para **batångga-n** karabåo esti
FUT **shed-LINK** carabao this
'this is going to be a carabao shed' (Chung 2012: 8)

b. para **gatbesa** ha'
FUT **decoration** EMPH
'[she] is going to be a decoration' (Chung 2012: 20)

In the two examples above, the meaning of the object words 'shed' and 'decoration' are predictable when used in a predicative context: 'be a shed/decoration'. However, words used in their non-prototypical functions very frequently do not have predictable meanings. Consider the example in (15).

(15) Chamorro (Austronesian > Malayo-Polynesian)

ma	**se'si'**	i	babui
AGR	**knife**	the	pig

'they stabbed the pig' (Chung 2012: 29)

In this example, the meaning 'stab' cannot be predicted from the meaning of the object word 'knife'. It could have just as easily meant 'be a knife' or 'cut'.

van Lier takes examples like those in (14) to be instances of genuine multifunctionality, and those in (15) to be cases of conversion. Others have also adopted a position similar to van Lier's, in which only the semantically compositional / predictable uses of a word in different discourse functions are considered flexible (Croft 2001b: §2.2.2–§2.2.3; Evans & Osada 2005: §3.2).

2.3.1.4 Precategoriality / Acategoriality

The various approaches which analyze flexible words as being at some level uncategorized until they receive their interpretation from context may be lumped together under the umbrella terms *precategoriality* or *acategoriality*. Hopper & Thompson's influential paper 1984 is an early application of the concept of acategoriality to the analysis of flexible words:

> [L]inguistic forms are in principle to be considered as *lacking categoriality* completely unless nounhood or verbhood is forced on them by their discourse functions. To the extent that forms can be said to have an apriori existence outside of discourse, they are characterizable as *acategorial*; i.e. their categorical classification is irrelevant. Categoriality-the realization of a form as either a N or a V-is imposed on the form by discourse. (Hopper & Thompson 1984: 747)

The term *precategorial* has become a somewhat more common term for roughly the same concept (though some researchers use the term in more strictly-delineated ways) (Evans & Osada 2005: 357, 362–364; Bisang 2008; 2013). It is especially preferred by morphological models that presuppose stages of derivation, such that words are precategorial before they reach a certain stage of the derivation (Halle & Marantz 1994; Arad 2005; McGinnis-Archibald 2016;

Siddiqi 2018). Vapnarsky & Veneziano (2017b: 5) distinguish polycategoriality from acategoriality by defining acategoriality as implying "no primitive / original categorial marking at all", and polycategoriality as allowing a form "to be only partially unspecified for category, with possible constraints on the relevant categories". Languages for which precategorial analyses have been advanced include Cherokee (Haag 2017), Gooniyandi (McGregor 2013), Kuikuro (Franchetto & Santos 2017), Mundari (Hengeveld & Rijkhoff 2005), and many others. Pfeiler (2017) also presents pscyholinguistic evidence that the earliest utterances of L1 learners of Yucatec Maya are acategorial.

A central concern in precategorial approaches is the precise mechanism by which a word receives its categorization in context (Hengeveld, Rijkhoff & Siewierska 2004: §3.7). There are two main theories of semantic indeterminacy in flexible words: *underspecificity* (Farrell 2001; Rijkhoff & van Lier 2013) and *vagueness* (Tuggy 1993; Hengeveld, Rijkhoff & Siewierska 2004; Hengeveld & Rijkhoff 2005). The essential difference is that underspecificity entails semantic minimalism while vagueness is entails semantic maximalism. An underspecified word has a minimal, core meaning, and receives its categorial meaning from the discourse context it appears in; a vague word has a maximal, broad meaning that covers all the possible discourse contexts it appears in. (There is of course quite a deal of variation in the literature as to how scholars use these terms, with many researchers conflating the two.) Hengeveld & Rijkhoff (2005: 414) offer the example of English *cousin* as a word that is semantically underspecified for gender, such that the gender of the referent must be understood from context. Denison (2018) argues that the English word *long* exhibits adjective ~ adverb underspecification in Old English and Middle English.

In contrast, Hengeveld, Rijkhoff & Siewierska (2004: 539–541) outline a theory regarding exactly how vagueness operates in the context of lexical flexibility:

> [E]ach flexible lexeme has a single (vague) sense. By placing the flexible lexeme in a particular syntactic slot or by providing it with certain morphological markers, the speaker highlights those meaning components of the flexible lexeme that are relevant for a certain lexical (verbal, nominal, etc.) function. Thus we contend that the meaning of a flexible

> lexeme always remains the same, and that morphosyntactic and other contextual clues signal to the addressee how to interpret this lexeme in an actual utterance. In other words, it is the use of a vague lexeme in a certain context (an actual linguistic expression) that brings out certain parts of its meaning, giving the category-neutral lexeme a particular categorial (verbal, nominal, etc.) flavour. (Hengeveld & Rijkhoff 2005: 541)

(Note that while vagueness implies a certain potential ambiguity, Hengeveld & Rijkhoff reserve the term *ambiguity* for cases of distinct, homophonous words.)

Evans & Osada (2005: 363–364) and Kihm (2017) criticize both precategorial approaches for their imprecision, claiming that it would be impossible to formulate a definition for many flexible words that was broad enough to encompass all their uses. Kihm (2017: 87) illustrates this difficulty with the various meanings of the Arabic root *s-q-t*, which could arguably be glossed FALL. A selection of stems containing this root are given in (16).

(16) Standard Arabic (Afroasiatic > Semitic)

saqata	'to fall'
saqiit	'hail'
saqqaata	'door latch'
masqat	'place where a falling object lands; waterfall'
isqaat	'overthrow; shooting down; miscarriage; substraction'
tasaaqut	'fall of hair'
saaqita	'fallen woman; harlot'
suquut	'fall; crash; collapse'
saqt	'dew'
siqt	'miscarried fetus'
suqt	'sparks flying from a flint'
saqat	'offal; rubbish'
saqta	'tumble; slip; mistake'
saaqit	'fallen; mean; missing'

It is difficult to imagine a single definition of *s-q-t* which could adequately demarcate just this set of meanings. This difficulty could perhaps be overcome, however, by loosening the requirement that the meaning of a word be unitary. Word meanings are *polycentric*, where different senses of a word are related through *meaning chains* rather than all through a single, central member (Taylor 2003: 110). This is sometimes referred to as a *family resemblance* structure for categories. The difference between monocentric and polycentric categories is illustrated schematically in Figure 2.2. In both diagrams, each letter A–E represents a sense

of a word. In the monocentric case, all the senses of the word are related through its core sense A. In the polycentric case, senses A and E are related only through their intervening connections.

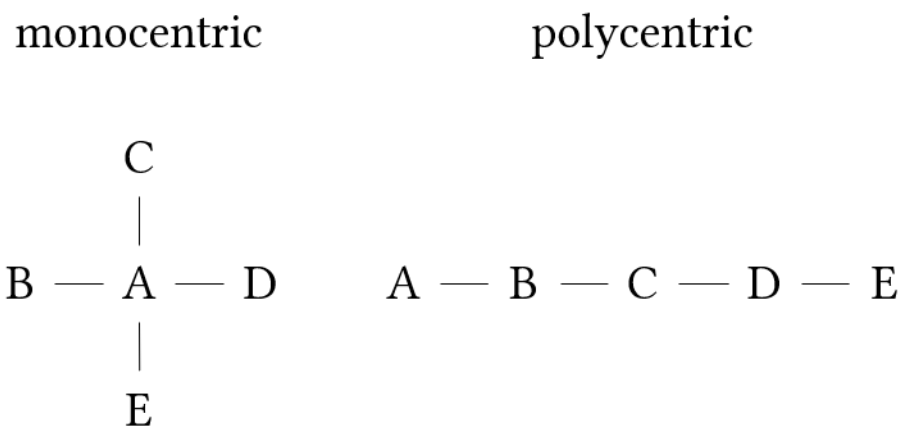

Figure 2.2: Monocentric versus polycentric categories

Recognizing that word meanings are polycentric addresses Evans & Osada and Kihm's criticisms of vagueness theory because it shows that the disparate senses of a word can be related without having to share any core component of their meanings. The use of a lexeme in a certain context then profiles one of these senses over others. Kihm himself hints at this solution by referring to the related Arabic stems in (16) as a *lexical family*.

2.3.1.5 Monocategoriality

In the extreme case where all lexical words in a language are precatgorial, the language could be considered *monocategorial*, possessing a single, open syntactic category. This is effectively the same as saying that the language lacks lexical categories altogether, the difference being primarily one of emphasis. David Gil analyzes both Tagalog (1995) and Riau Indonesian (1994) as being of this extreme monocategorial type. Moreover, he argues that monocategoriality must have been typical of an earlier stage of language evolution in which dedicated morphosyntactic constructions for different discourse functions had yet to evolve (Gil 2005; 2006; 2012). He names this abstract language type an *Isolating-Monocategorial-Associational*

(IMA) language.

2.3.1.6 Transcategoriality

It is also worth briefly mentioning *transcategoriality*, since the term arises occasionally in connection with lexical flexibility and is potentially easily confused with other terms mentioned above. Robert (2003) uses *transcategoriality* to describe the ability for a single form to serve both lexical and grammatical functions. This is common in grammaticalization scenarios in which the original, lexical use of a form continues to exist alongside its newer, functional use. This is commonly referred to in the grammaticalization literature as *divergence* (Hopper & Traugott 2003: 118). Since the focus of lexical flexibility is on *lexical* words and categories rather than *functional* ones, the concept of transcategoriality is not directly relevant to the study of lexical flexibility.

2.3.1.7 Conversion / Zero derivation

Since the literature on conversion and zero derivation is extensive and the concepts are well-established, I will treat them only summarily here, focusing on their relationship to lexical flexibility. *Conversion* is the process whereby a lexical item simply changes its word class with no overt morphological marker of that change (Crystal 2008: 114). *Zero derivation* is an alternate analysis of the same phenomenon that posits the presence of a derivational marker with no phonological realization. I prefer the term *conversion* in this thesis.

The concept of conversion is based on the premise that words are fully categorized for part of speech, meaning that an analysis of lexical flexibility as conversion falls under the categorial (as opposed to non-categorial) analyses of lexical flexibility mentioned at the beginning of Section 2.3.1. Conversion is generally characterized as a kind of word formation, implying that a new word has been created. Therefore, conversion and lexical flexibility are mutually exclusive analyses of multifunctional words; lexical flexibility implies the existence of one polysemous word which can fulfill multiple discourse functions, while conversion implies

the existence of two homonymous / heterosemous words with different discourse functions. Remember too from Section 2.3.1.3 that van Lier (2012) distinguishes conversion from multifunctionality, where conversion is reserved for unproductive / unpredictable derivations. Not all scholars would delimit conversion in this way however.

Conversion also implies directionality. In cases of conversion, one of the two uses of a form is in some way basic or prior to the other (Mithun 2017: 156; Vapnarsky & Veneziano 2017b: 5). Under a flexible analysis, by contrast, the different functions of a single flexible lexeme have equal theoretical status. If it could be shown that certain seemingly flexible uses of a word were in some way marked in relation to each other, this would therefore constitute potentially disconfirming evidence against a flexible analysis. This is in fact one of the major arguments presented against flexible analyses, to be discussed in Section 2.3.3. There are at least four ways in which one member of a putatively flexible set of lexical items might be considered more basic than the others: diachronically, in which one sense of the word appears before the others historically; semantically, in which the meaning of the derived word is more semantically complex than that of the basic word; morphologically, in which the more basic word is irregularly inflected but the derived word is regularly inflected; or frequentially, in which derived words are used less frequently than their base words (Plag 2003: 108–111). Speakers themselves also have intuitions about which member of a flexible set is basic and which are derived (Mithun 2017: 166). As will be explained in Section 2.4.2, the idea that certain uses of a form are marked in relation to each other is also central to Croft's typological markedness theory of lexical categories.

2.3.1.8 Functional shift / Functional expansion

Especially in the American context, another common term for conversion is *functional shift* (Cannon 1985). In most research, the term is used essentially interchangeably with *conversion* or *zero derivation*. However, functional shift can be usefully distinguished from conversion by its emphasis on function over than category, paralleling the distinction between polycat-

egoriality (implying language-specific categories) and polyfunctionality (with no such implication). In its literal interpretation, the term suggests a shift in the meaning of a word from one discourse function to another, an analysis amenable to a constructional approach, and one that is not committed to the existence of language-particular categories. A slight improvement on this term would be *functional expansion*, since it emphasizes the expansion of a linguistic form into new functions / contexts as opposed to the wholesale shift from one function to another implied by *functional shift*.

2.3.2 Key findings

The emergence of lexical flexibility as an object of study has led to a number of edited collections or journal volumes focused on flexibility and word classes more generally (Vogel & Comrie 2000, Evans & Osada 2005 (target article), Ansaldo, Don & Pfau 2010, Lois & Vapnarsky 2003, Rijkhoff & van Lier 2013, Simone & Masini 2014, Błaszczak, Klimek-Jankowska & Migdalski 2015, Vapnarsky & Veneziano 2017a, van Lier 2017 (target article), Vapnarsky & Veneziano 2017b, Cuyckens, Heyvaert & Hartmann 2019), plus any number of individual articles (see especially Farrell [2001], Rijkhoff [2007], van Lier [2012], and Mithun [2019]). Out of these collections have emerged several recurring findings, each of which is summarized in this section.

2.3.2.1 Parts-of-speech hierarchy

In addition to laying out a theory of flexible categories, Hengeveld (1992) also presents the results of a 30-language survey of parts of speech in which he finds that the categories which are most likely to occur as an independent class in a language are subject to an implicational hierarchy, shown in (17), which Hengeveld refers to as the *parts-of-speech hierarchy*.

(17) Verb > Noun > Adjective > Adverb

Categories to the left of the hierarchy are more like to occur as a distinct part of speech than

categories to the right. Applying this hierarchy to Hengeveld's flexible vs. rigid distinction yields the parts-of-speech typology in Figure 2.3 (adapted from Hengeveld [1992: 69] and Rijkhoff [2007: 718]). The terms for the different categories in flexible languages are from Hengeveld, Rijkhoff & Siewierska (2004). Hengeveld points out that this is not a strict classification scheme; languages may sit at the boundaries between types and exhibit exceptions.

<table>
<tr><th></th><th>predication</th><th>reference</th><th>predicate modification</th><th>referent modification</th></tr>
<tr><td rowspan="3">flexible</td><td colspan="4">contentive</td></tr>
<tr><td>verb</td><td colspan="3">non-verb</td></tr>
<tr><td>verb</td><td>noun</td><td colspan="2">modifier</td></tr>
<tr><td rowspan="4">rigid</td><td>verb</td><td>noun</td><td>adjective</td><td>adverb</td></tr>
<tr><td>verb</td><td>noun</td><td>adjective</td><td rowspan="3"></td></tr>
<tr><td>verb</td><td>noun</td><td rowspan="2"></td></tr>
<tr><td>verb</td><td colspan="3"></td></tr>
</table>

Figure 2.3: Hengeveld's (1992: 69) typology of parts-of-speech systems

As mentioned in Section 2.3.1.1, Hengeveld's typology could be criticized for its reliance on large, language-specific lexical categories instead of constructions. One could however reframe Hengeveld's implicational hierarchy in terms of functions rather than catgories, as in (18). I call this the *hierarchy of discourse functions*.

(18) predicate > referent > predicate modifier > referent modifier

In (18), functions to the left of the hierarchy are more likely to have dedicated morphosyntactic constructions than those to the right. This reformulation avoids a commitment to any language-particular categories while still capturing the important implicational trend observed by Hengeveld.

This hierarchy of discourse functions has proven to be a fairly robust finding in the literature on lexical flexibility, now supported by a number of subsequent studies (Anward 2000; Rijkhoff 2000; Vogel 2000; Beck 2002; Rijkhoff 2002; 2003; Hengeveld, Rijkhoff & Siewierska 2004; van Lier 2006; Hengeveld 2007; Hengeveld & van Lier 2012; Hengeveld & Valstar 2010;

Beck 2013; Bisang 2013; Hengeveld 2013).

2.3.2.2 Reference-predication asymmetries

The hierarchy of discourse functions also hints at another important feature of lexical categories: there is something privileged about the predicating function. A survey of the literature on lexical flexibility reveals patterned asymmetries in the behavior of lexical items with regard to predication vs. reference, even in very flexible cases. For starters, while it is quite common for languages to freely allow object words to be used as predicates with no special marking, the reverse case is much less likely Hopper & Thompson (1984: 745). The functional expansion of a word's uses from predication into reference always seems to be more marked (or at least as marked) as the shift from a referring function to a predicating function.

This fact has been observed independently by numerous researchers. For example, Stevick (1968: 251) and Marchand (1969: 373–374) both observe that conversion from noun to verb in English has always been more common than from verb to noun, and Kastovsky (1996: 98) points out that English does not even have a native noun > verb derivational suffix—any affixes of this type are borrowed from Romance languages. Central Alaskan Yup'ik is another example of a language with very many nominalizers but few verbalizers (Mithun 2017: 158).

Flexibility itself is frequently *unidirectional*, meaning that any object word many be used for predication, but that action words used for reference are marked (Croft 2001b: 69; Evans & Osada 2005: §3.3; Beck 2013). Nakayama (2001: 44) frames flexibility in Nuuchahnulth in terms of a word's ability to predicate, reporting that "all inflectional stems are potentially predicative", but the reverse is not true. Discussing Classical Nahuatl, Launey (1994; 2004) introduces the term *omnipredicativity* to describe languages in which all words are potentially predicative, but no corresponding term *omnireferentiality* has appeared in the literature. That said, languages which have undergone *insubordination* (in which subordinate, usually nominalized clauses are reanalyzed as main clauses, and the nominal inflectional marking of the subordinate clause is reinterpreted as verbal inflectional marking [Evans 2007; Mithun 2008;

Evans & Watanabe 2016]) do exhibit noun-oriented flexibility in the sense that verbal inflection mirrors nominal inflection. This famously led to the claim that all words in Eskimo languages are fundamentally nominal in nature (Sadock 1999). However, cases of insubordination do not constitute counterexamples to the predicating tendency in language. Even in these languages, the use of action words for reference is still less marked than the use of object words for predication; this includes Eskimo, as mentioned for Central Alaskan Yup'ik above.

Kastovsky (1996) argues that this asymmetry arises from the fact that "deverbal nouns have a much more diversified semantics than denominal verbs" (Kastovsky 1996: 96), meaning that the range of possible meanings for a deverbal noun (a noun derived from a verb) is significantly broader than for a denominal verb (a verb derived from a noun). Examining data from English, Kastovsky shows that when an object word is used to predicate,its possible meanings are limited to combinations of BE, BE LIKE, BE IN, BECOME, HAVE, DO, DO WITH, and CAUSE. When an action word is used as a predicate, however, the range of meanings include any abstract representation of the event itself (an action nominalization), or any one of the arguments associated with the verb, which come in a variety of semantic roles.

A similar, cognitively-oriented explanation for reference-predication asymmetries is given by Hopper & Thompson (1984: 745):

> [A] nominalization names an event taken as an entity; however, a "verbalization" does not name an "entity taken as an event", but simply names an event associated with some entity. In other words, a nominalization still names an event, albeit one which is being referred to rather than reported on in the discourse; it is, accordingly, still in part a [verb], and not a enquotebona fide [noun]. However, a denominal [verb] no longer names an entity at all, and thus has no nominal "stains" to prevent its being a bona fide [verb]. (Hopper & Thompson 1984: 745)

Hopper & Thompson (1984: 746) analyze nominalizations as a kind of metaphor following Lakoff & Johnson: 3a, in which an abstract event is conceptualized as a concrete object. However, no such metaphor exists for verbalizations, explaining the asymmetry in the directionality of lexical flexibility.

2.3.2.3 Locus of categoriality

The grammatical level at which a language exhibits flexibility—the root, the stem, or the fully-inflected word—differs from one language to the next. In some languages, roots are strongly associated with a particular discourse function, but stems are flexible; in other languages, the reverse is true. I refer to the linguistic level at which a language associates different discourse functions as its *locus of categoriality*. Some linguistic theories include a premise that the locus of categoriality in every language always sits at a certain level (Halle & Marantz 1994; Baker 2003; 2015; Booij & Audring 2018; Siddiqi 2018), but the evidence from research on lexical flexibility gives strong empirical support to the position that locus of categoriality varies from language to language. In contrast, Błaszczak, Klimek-Jankowska & Migdalski (2015) argue that category information is distributed across different levels of representation.

As one illustration of how flexibility depends on grammatical level, we have seen that roots in Central Alaskan Yup'ik are generally categorical—except for 12% of roots, they are typically strongly associated with just one discourse function, and derivational affixes select for roots of a particular category (Mithun 2017: 162–167). While many derived stems are also strictly associated with just one discourse function, a large but indeterminate number have both referential and predicative uses. Examples of such flexible stems have already been shown in (7) in Section 1.1. Fully-inflected words in Central Alaskan Yup'ik, however, never exhibit flexibility (Mithun 2019: 6). So Central Alaskan Yup'ik displays partial flexibility at the root and stem level but not the inflected word level.

As another example, in Mandinka all stems are flexible. No Mandinka stem except for *sǎa* 'die' is used in just one discourse function (Creissels 2017: 46). At the level of the inflected word, however, lexical items in Mandinka belong unambiguously to one category or another (Creissels 2017: 37). Mandinka therefore shows complete flexibility at the stem level but complete rigidity at the inflected word level. (Creissels does not include an analysis of roots in his discussion.)

Surprisingly, some languages display flexibility even at the level of the fully-inflected

word. In many North American languages, it is common for fully morphological verbs to function as referents (Hieber forthcoming), as shown in the following examples.

(19) Chitimacha (isolate)

a. dzampuyna
dza-ma-(p)uy-na
thrust-PLACT-HAB-NF.PL
'they usually thrust / spear with it'
'spear' (Swadesh 1939a: 56)

b. pamtuyna
pamte-(p)uy-na
ford-HAB-NF.PL
'they usually cross (it)'
'bridge' (Swadesh 1939a: 17)

(20) Cayuga (Iroquoian > Lake Iroquoian)

a. ǫtekhǫnyáʔthaʔ
ye-ate-khw-ǫni-aʔt-haʔ
INDEF.AGT.REFL-meal-make-INSTR-IPFV
'one makes a meal with it'
'restaurant' (Mithun 2000: 200)

b. kaǫtanéhkwih
ka-rǫt-a-nehkwi
NEUT.AGT-log-EP-haul.IPFV
'it hauls logs'
'horse' (Mithun 2000: 200)

(21) Navajo (Na-Dene)

a. tsinaaʾeeɬ
tsi(n)-naaʾeeɬ
wood-it.moves.about.floating
'ship, boat' (Young 1989: 316)

b. chahaɬheeɬ
it.is.dark
'darkness' (Young 1989: 316)

Each of these flexible uses of a morphological verb sits somewhere on a continuum between being fully lexicalized as a referent, so that its predicating use is no longer available, to being a fully productive predicate, with both predicative and referential uses (Mithun 2000: 413).

The reason that words may exhibit flexibility at one level of analysis but not another is because "*categorial* shift is often not *categorical*" (Mithun 2019: 1). When a word expands its use into new contexts, not all the morphological, syntactic, and semantic properties of the word shift to accommodate that new use at the same time. It takes some time before the morphosyntactic properties of a word adjust to reflect its new use, a process referred to as *actualization* in the grammaticalization literature (De Smet 2012) and *post-constructionalization constructional changes* in the framework of diachronic construction grammar (Hopper & Traugott 2003: 27).

It is because the locus of categoriality can vary from language to language that I have used the vague and overloaded terms *word* and *lexical item* throughout this thesis. Both are intended to be convenient cover terms for root, stem, or inflected word.

2.3.2.4 Item-specificity

A final significant finding to emerge from the empirical research on lexical flexibility is the fact that flexibility is item-specific and even sense-specific. Individual lexical items or even individual senses of an item differ in their flexibility. To say that lexical flexibility is *item-specific* is to say that two words that are otherwise very similar in their meanings and morphosyntactic behavior can nonetheless differ in terms of their flexibility.

This fact is very nicely illustrated by both Mithun's study of lexical flexibility in Central Alaskan Yup'ik and Creissels's study of Mandinka. Mithun (2017: 163–164), for example, considers roots for meteorological concepts, and shows that even within this small semantic domain, roots vary as to whether they exhibit flexibility. In (22a) the meteorological roots have predicative counterparts but in (22b) the meteorological roots do not.

(22) Central Alaskan Yup'ik (Eskimo-Aleut > Yupik)

a.	*amirlu*	'cloud'	*amirlu-*	'be cloudy'
	kaneq	'frost'	*kaner-*	'be frosted'
	aniu	'snow on ground'	*aniu-*	'to snow'
b.	*taituk*	'fog, mist'	**taitug-*	'be foggy'
	kavtak	'hailstone'	**kavtag-*	'to hail'
	mecaliqaq	'sleet'	**mecaliqar-*	'to sleet'

(Mithun 2017: 163)

Mithun also provides similar data illustrating flexibility gaps for the domains of clothing and instruments:

(23) Central Alaskan Yup'ik (Eskimo-Aleut > Yupik)

a.	*taqmak*	'dress'	*taqmag-*	'put on a dress'
	nacaq	'hat, parka hood, cap'	*nacar-*	'put on a hat, hood'
	atkuk	'parka'	*atkug-*	'put on a parka'
b.	**piluk*	'footwear'	*pilug-*	'put on footwear'
	at'e	'clothing'	*at'e-*	'don, put on clothing'
	kive	'pants'	*kive-*	'pull down pants'

(24) Central Alaskan Yup'ik (Eskimo-Aleut > Yupik)

a.	*ay'uytaq*	'hockey stick'	*ay'utar-*	'play hockey'
	iqsak	'fishhook'	*iqsag-*	'to jig for fish'
	kapkaanaq	'trap'	*kapkaanar-*	'to trap, get trapped'
	keviq	'plug, cork, stopper'	*kevir-*	'to plug, stuff, caulk'
	kuvya	'fishnet'	*kuvya-*	'fish by driftnetting'
b.	**kagi*	'broom'	*kagi-*	'sweep'
	ipuk	'ladle'	*ipug-*	'ladle, move with bow of boat high in air'
	pangeq	'double-bladed paddle'	*panger-*	'paddle with a double-bladed paddle'

On the basis of data like these, Mithun observes, "Speakers simply know whether a given root functions as a noun and what its meaning is, and whether it functions as a verb and what its meaning is. Gaps are not predictable[.]" (Mithun 2017: 163). These gaps also vary from dialect to dialect. While the dialect in the above examples has no predicative counterpart for *taituk* 'fog', the Nunivak Island dialect has a pair of roots *nugu* 'fog' and *nungu-* 'be foggy'.

Creissels's (2017) study of Mandinka is another good illustration of the item-specific nature of flexibility. While Mandinka has nominal and verbal constructions that allow the predicative and referring functions of words to be distinguished unambiguously, it is not as easy to separate word stems themselves into similar classes. In Mandinka, all items are flexible, but the *way* in which items are flexible varies. Stems in Mandinka may be divided into three

classes on the basis of their semantic behavior with regards to flexibility:

- *verbal* lexemes are those whose meaning is predictable when used to refer and therefore analyzable as a case of "morphologically unmarked nominalization"; these are always event nominalizations
- *verbo-nominal* lexemes are those whose meaning in referring constructions is idiosyncratic and therefore not predictable
- *nominal* lexemes are those whose meaning when used as predicates is predictable and limited to 'provide someone with X'

In Mandinka, therefore, flexibility must be considered on an item-by-item basis, since the behavior of each item with regard to flexibility may differ.

In fact, flexible behavior in Mandinka is not just item-specific, but sense-specific as well. Creissels (2017: 54) reports that polysemous lexemes may show different behavior for their different senses. The word *díŋ*, for example, has two senses: 'child, young (of an animal)' and 'fruit'. However, only the 'fruit' sense is available for predication; when used as an intransitive verb, *díŋ* may only mean 'bear fruit', not 'give birth', even though 'give birth' is a perfectly conceivable meaning of this word in predication. In the sense of 'child, young (of an animal)', *díŋ* behaves as a nominal lexeme, but in the sense of 'fruit' it behaves as a verbo-nominal lexeme. When lexical items undergo functional expansion into new discourse functions, it is also only specific senses that do so, not every sense of the word. More evidence for this comes from the diachronic development of the word *run* in English: though the word *run* when used as a predicate has numerous senses, the earliest attestations of *run* used referentially are by and large with just the sense of 'fast pedestrian motion' (the exceptions to this stemming from just one corpus file) (Gries 2006: 76). Other refential uses of *run* did not develop until later.

The existence of dialectal differences for flexibility as well as the unpredictable meanings of lexical items when used in various discourse functions show that the development of flexibility depends on conventionalization—whether a given form has assumed a conventionalized meaning in its role for a specific discourse function. These conventionalizations are language-specific, dialect-specific, item-specific, and even sense-specific (Croft 2000: 97). Speakers can

and do playfully use existing lexical items for new discourse functions, but it is not until that combination of form and discourse function is conventionalized with a specific meaning in a community of speakers that we can say the word has undergone functional expansion. An excellent illustration of this is the word *friend* in English. Prior to the public availability of the social networking site Facebook in 2006, the use of *friend* as a predicate had not been widely conventionalized. The growth of social networking then led to the very specific use of *friend* to mean 'add as a connection on a social networking site'. Note that it does *not* have the more general sense of 'be a friend' or 'befriend'. Like with Yup'ik and Mandinka, this shows not just that flexibility is item-specific, but that the meaning of flexible uses is often item-specific as well; in many cases it is unpredictable and must be memorized by speakers.

2.3.3 Problems & critiques

Despite the robust findings in Section 2.3.2, researchers have challenged the very possibility of lexical flexibility and its presence in various languages. Some of these challenges stem from the fact that certain conceptions of lexical flexibility are based on traditional ideas about the existence of large, language-specific parts of speech, and therefore subject to the same set of criticisms. Other challenges stem from precisely the facts presented in the previous section, especially that both flexibility and the meaning of flexible words are item-specific and often unpredictable, such that these words are not truly "flexible". Moreover, languages must indicate the discourse function of their words *somehow*—this is basic to our ability to communicate. So in a certain sense, the idea that there are words which are fully ambiguous as to their discourse function is doomed at the outset. The question is really where these indications of pragmatic function live—the root, the stem, the inflected word, or the clausal context. This section summarizes the main criticisms that scholars have raised against flexible analyses. In Section 2.4, we then look at alternative theories of word classes and their approach to lexical flexibility.

2.3.3.1 Methodological opportunism

A methodological problem with certain theories of flexible words is that they, like traditional theories, commit the fallacy of *methodological opportunism* (Croft 2001b: 30, 41) presented in Section 2.2.3. They do not apply the distributional method consistently. Instead, the criteria which separate words into categories are determined on the basis of additional theoretical commitments. Croft (2001b: §2.2.2) criticizes Hengeveld's parts-of-speech typology on this basis, noting that Hengeveld ignores distributional evidence for classes smaller than the ones he posits in his typology (noun, contentive, etc.). Evans & Osada (2005) raise similar concerns for Hengeveld's theory as applied to Mundari. They state that in order for two lexical items to be members of the same lexical class, they must have *equivalent combinatorics*, which is to say that their distributions should be identical (Evans & Osada 2005: 366). Evans & Osada also state that in order for a language to flexible, that flexibility must be *exhaustive* in the sense that all members of a putatively flexible class must show equal degrees of flexibility and *bidirectional* in the sense that nouns may be used as verbs and vice versa. Both these criteria are merely different ways of reframing the broader principle that words in a class should share the same distributions (Croft 2005: 434). Evans & Osada proceed to show various ways in which these criteria are not applicable to Mundari, and that Mundari is therefore not a flexible language. At the same time, however, Evans & Osada use these facts to argue for the existence of the equally problematic categories of Noun and Verb in Mundari, using just a "canonical subset of distributional facts" (Evans & Osada 2005: 434, fn. 17). Croft's (2005) commentary on Evans & Osada's target article is partially devoted to critiquing them on this point. The problem of methodological opportunism is present for any analysis which assumes that languages have a small set of large lexical categories—whether that analysis is flexible or traditional.

2.3.3.2 Semantic shift

Broadly speaking, however, the primary argument against theories of flexible word classes is that they ignore a great deal of item-specific knowledge that speakers have about words and their uses in different functions (Evans & Osada 2005: §3.2; Beck 2013: 216). This issue has already been discussed in some detail in Section 2.3.2.4, but it bears explaining precisely why such item-specific knowledge constitutes a problem for theories of lexical flexibility.

For starters, when a lexical item expands into a new discourse function, there is a *semantic shift* in the direction of the meaning typically associated with the new context (Croft 1991: 74–77; 2001b: 73). For example, when a property word is used in a referring expression, its meaning shifts to a person or thing with that property, not a reference to the abstract property itself. These semantic shifts cannot be attributed to some broader pragmatic principles—they are a matter of convention, and require broader uptake in a community of speakers in order to be conventionalized (as illustrated with the English word *friend* above). Because the meaning that results from this semantic shift is conventional, often idiosyncratic, and language-specific, flexible words cannot be truly productive, as is implied by the term "flexible". There is always a conventionalized component to their meanings.

Examples of idiosyncratic and unproductive shifts in the meaning of flexible words abound in the literature. Consider again the examples from Mundari in (3), repeated here as (25).

(25) Mundari (Austroasiatic > Munda)

a. buru=ko bai-ke-d-a.
mountain=3PL.SUBJ make-COMPL-TR-IND
'They made the mountain.' (Evans & Osada 2005: 354)

b. saan=ko buru-ke-d-a.
firewood=3PL.SUBJ mountain-COMPL-TR-IND
'They heaped up the firewood.' (Evans & Osada 2005: 355)

As a predicate, the stem *buru* means 'heap up', but this meaning is not predictable from just the combination of the nominal sense 'mountain' and its predicative use. The word could have just as easily meant 'climb a mountain' or 'overcome' or simply 'be a mountain'. No

general pragmatic principles could have predicted this meaning. Likewise consider the Central Alaskan Yup'ik examples from (7c). Why does the combination of *iqeq-* 'corner of mouth' + *-mik* 'thing held in one's mouth', 'to put in one's mouth' result in *iqmik* 'chewing tobacco'? Why not 'oral thermometer' or 'toothpick'? Mithun provides many more unpredictable examples, shown in (26).

(26) Central Alaskan Yup'ik (Eskimo-Aleut > Yupik)

a.	*mecur-*	'get blood poisoning'
	mecuq	'liquid part of something, sap, juice, green/waterlogged wood'
b.	*melug-*	'suck; eat roe directly from the fish'
	meluk	'fish eggs, roe, fish eggs prepared by allowing them to age and become a sticky mess'
c.	*qager-*	'explode, to pop'
	qageq	'blackfish which is boiled, allowed to set in its cooled, jelled broth'
d.	*qumig-*	'hold inside (of clothing)'
	qumik	'enclosed thing, thing inside, fetus'
e.	*aveg-*	'divide in half, to halve'
	avek	'half'; also 'half-dollar; person who is half Native'
f.	*napa-*	'stand upright'
	napa	'tree'
g.	*yuurqar-*	'sip'
	yuurqaq	'hot beverage, tea'

Or consider the example from Cayuga in (20b), repeated here as (27).

(27) Cayuga (Iroquoian > Lake Iroquoian)

kaǫtanéhkwih
ka-rǫt-a-nehkwi
NEUT.AGT-log-EP-haul.IPFV

'it hauls logs'
'horse' (Mithun 2000: 200)

Of all the possible nominal meanings that could reasonably derive from 'it hauls logs'—cart,

tractor, ox—the fact that its nominal use means 'horse' is a fact specific to Cayuga that must merely be memorized by speakers.

Conventionalizations of lexical items used in new discourse functions also vary across languages. While the principle of semantic shifts still broadly holds, the specific meanings of these conventionalizations are unpredictable. Croft exemplifies this point by comparing English *school* with Tongan *ako* 'school / study'.

> English *school* used predicatively does not mean the same thing as Tongan *ako* used predicatively, namely 'study'. Going in the opposite direction, English *study* used referentially does not mean the same thing as Tongan *ako* used referentially, namely 'school'. Finally, English *small* used referentially does not mean the same thing as Tongan *si'i* 'childhood' used referentially. (Croft 2000: 71)

Since the meanings of putatively flexible words in different discourse functions are not predictable, many scholars reason that these words cannot be truly "flexible" in the sense of multifunctional or precategorial.

2.3.3.3 Lexical gaps

Just as unpredictable in flexible cases is which sense of a word will be coopted into the new discourse function. In Wolof, for example, the referential use of the word *ndaw* can only mean 'young', whereas the predicative use may mean either 'be young' or 'be little, small' (Kihm 2017: 91). We have also already seen similar lexical gaps for Central Alaskan Yup'ik in Section 2.3.2.4 above. If a lexical item lacks any conventionalized use in different discourse functions, than it cannot rightly be considered flexible, or a member of a flexible word class.

2.3.3.4 Counterarguments

Pointing out that functional expansion involves both semantic shifts and functional gaps is generally intended to show that lexemes cannot be truly flexible in the sense of being multifunctional (§2.3.1.3) or precategorial (§2.3.1.4), and that uses of the same lexical item

for different discourse functions should therefore be considered cases of conversion—that is, homonymy or heterosemy. There are however two major problems with this argument.

The first is that it creates a false dichotomy between homonymy and polysemy, when in fact the two phenomena are opposite endpoints on a continuum. Debates over the lexical unity of a word—that is, whether two uses of a lexical item are homonymous or polysemous—arise from an Aristotelian desire to neatly sort those uses into distinct lexemes, when in fact reality is much more complex. If this problem sounds familiar, that is because it is exactly the same methodological problem that arises when trying to exclusively categorize words into different classes. The complex adaptive nature of language makes categorical classification at either level impossible.

As discussed in Section 2.3.1.4, we know from cognitive research that mental categories are prototypal, and that the meanings of words display a polycentric, family resemblance structure. Two senses of a word are often related only tenuously through a network of intervening semantic connections or meaning chains. Langacker (1988) calls this the *network model* of category structure. Taylor points out that "[o]ne consequence of adopting the network model is that the question of whether a word is polysemous or not turns out to be incapable of receiving a definite answer." (Taylor 2003: 167)

Over time, as this lexical network expands, the meanings of a word can diverge so drastically that speakers no longer have a direct cognitive association between them. Mithun exemplifies this nicely for both Cayuga and English. Discussing morphological Verbs used as referents in Cayuga, she notes the following:

> If asked the meaning of *kaǫtanéhkwih* ['it hauls logs'], Cayuga speakers normally respond 'horse'. Though it has the morphological structure of a verb, it has been lexicalized as a nominal. The literal meanings of many verbal nominals are still accessible to speakers, but the origins of others have faded, and speakers express surprise at discovering them. Similarly, when asked "What would you like for breakfast?", most English speakers do not think about breaking their night-time fast, though they can usually be made aware of the literal meaning of *breakfast*. (Mithun 2000: 413)

Lexicalization is a process and a continuum. Words can be lexicalized in new discourse func-

tions to varying degrees. The first use of a lexical item in a new discourse function is innovative; each subsequent use then contributes further to its conventionalization.

Pointing out that functional expansion often creates idiosyncratic and unpredictable meanings essentially amounts to saying that senses of words can be highly divergent. This point is not in itself an argument against flexible analyses. Flexible words themselves may sit anywhere on the continuum from having closely connected, productive and predictable meanings, to having extremely divergent, idiosyncratic and unpredictable meanings. This is not a special fact about flexible words; it is simply true of words generally.

Croft (2001b: 73) expresses concern that ignoring semantic shifts in the analysis of flexible words overlooks important insights about how such semantic shifts are patterned (specifically, the universal fact that semantic shifts are always in the direction of the word's new discourse function). Given that so many researchers have indeed ignored semantic shift when arguing for flexible analyses, Croft's concern is warranted. However, it is entirely possible to define lexical flexibility in a way that both allows for the meaning of a lexical item to encompass multiple discourse functions and acknowledges that such multifunctional uses of the word involved patterned semantic shifts. The way to do this is to ground the definition of lexical flexibility in the pragmatic functions of reference, predication, and modification reather than language-specific categories like Noun, Verb, and Adjective. I offer such a definition in Section 2.5.

The second significant problem with using semantic shifts as an argument against the existence of flexible lexemes is that it proves too much. If semantic shift is taken as evidence against the lexical unity of putatively flexible words, then it must also be taken as evidence against the lexical unity of non-flexible words. Put simply, semantic shift is an analytical problem for all words, not just flexible ones.

This fact becomes clear when we ask, "What counts as a semantic shift? Just how 'large' of a change in meaning (if it were even possible to quantify such a thing) does a semantic shift require?" To illustrate this problem, consider the semantic contribution of plural mark-

ing crosslinguistically. In the canonical case, plural marking is considered inflectional rather than derivational (Corbett 2000: 2), meaning that it does not create a new lexeme. Instead, it modifies the meaning of the existing lexeme slightly, in line with the classic distinction between inflection vs. derivation. However, there are numerous cases of words in English with more or less drastic differences in meaning between the singular and plural, and/or senses that are only available in one of the two numbers. Consider the examples in (28).

(28) English (Indo-European > Germanic)

a.	*air*	'atmosphere'
	airs	'affected manners'
b.	*arm*	'upper limb; anything resembling a limb'
	arms	'weapons, firearms'
c.	*blind*	'unable to see'
	blinds	'screen for a window'
d.	*character*	'personality, mental qualities'
	characters	'people in a novel, play, or film'
e.	*custom*	'tradition; socially accepted behavior'
	customs	'department which levies duties on imports'
f.	*force*	'strength, energy'
	forces	'collection of military units'
g.	*good*	'excellent, high quality'
	goods	'merchandise or possessions'
h.	*manner*	'way of doing something'
	manners	'social conduct; socially acceptable conduct'
i.	*spectacle*	'visually striking performance or display'
	spectacles	'pair of glasses'
j.	*wood*	'fibrous material in the trunk of trees or shrubs'
	woods	'area of land covered with trees'

Semantic shifts for plural marking in English are not limited to just a handful of specific lexical items. Generic uses of the plural as in the expression *foxes are cunning* create a semantic shift away from a concrete entity (*a/the fox*) to a generic, unperceivable one—a use which

strays from the prototypical function of nouns as concrete perceptible entities (Hopper & Thompson 1984: 708).

As with flexible words, the semantic shifts that occur with plural marking can become so substantial that speakers no longer cognize the morphological singular and plural as members of the same word. Such is the case in the historical development of *brother* vs. *brethren* in English. *brethren* became so strongly conventionalized with its religious meaning in the plural that it was independently lexicalized as a plural-only (*plurale tantum*) noun, and the original plural underwent renewal with the emergence of the form *brothers*. This is exactly the kind of lexicalization process that occurred for many morphological verbs reanalyzed as nouns in Cayuga and many other North American languages.

A similar example comes from Chitimacha, which has a pluractional marker *-ma* indicating verbal number (plural agents, plural patients, or repeated action). In some cases the use of *-ma* is purely compositional, so that it can be considered merely an inflectional marker of verbal number. In other cases *-ma* so significantly alters the meaning of the word that it must be considered derivational. Compare the uses of *-ma* in each of the pairs of verbs in (29) (note that (29b) and (29c) are phrasal verbs with a preverbal particle).

(29) Chitimacha (isolate)

a.	*kow-*	'call'
	kooma-	'call multiple people'
b.	*qapx cuw-*	'come back; go about'
	qapx cuuma-	'travel; wander'
c.	*qapx qiy-*	'turn together; mix, join'
	qapx qiima-	'give a prayer, benediction; perform magic'

(Swadesh 1939a)

In (29a), the use of *-ma* is entirely compositional. The presence of *-ma* indicates that the verb has a plural patient argument. In (29b), the use of *-ma* is still arguably compositional, though perhaps somewhat lexicalized given the high frequency with which the word appears in the texts. 'travel, wander' could reasonably be interpreted as a continued repetition of 'go about'.

In (29c), however, *qapx qiima-* has become lexicalized with a new meaning not directly related to that of *qapx qiy-*. The diachronic connection between the two meanings is that prayers and magical incantations were traditionally accompanied by circling gestures with the arms. *qapx qiima-* originally meant 'turn/circle around repeatedly', but over time lexicalized with its new religious meaning in the pluractional, 'give a prayer, benediction'. This lexicalization process parallels that of *brethren* in English. Such a range of inflectional vs. derivational uses of pluractionals is quite common crosslinguistically (Mithun 1988; Mattiola 2020).

Finally, there are many languages which do not typically mark plurality on nouns (Dryer 2013), and yet have senses available in semantically plural contexts but not singular ones (where the semantic number can be understood from the clausal context, usually through verbal number marking). For example, the word *soq* in Chitimacha may mean 'foot' or 'paw' in a singular context and 'feet' or 'paws' in a plural context, but may also mean 'tracks' (e.g. animal tracks) in a plural context—a fairly significant and idiosyncratic shift in meaning, and one that is both language- and item-specific and thus conventional. This use constitues a *morphologically unmarked semantic shift* in the meaning of the word, just as idiosyncratic meanings of words in cases of functional expansion also constitute morphologically unmarked semantic shifts. If we take such unmarked semantic shifts as evidence against lexical unity in the cases of flexible words, then we must also say that the 'foot' and 'tracks' meanings of *soq* constitute two distinct lexemes as well.

One might ask, if we start splitting up lexemes based on every degree of semantic shift, where does the splitting stop? This is exactly analogous to the problem of lumping vs. splitting in the context of lexical categories. The Radical Construction Grammar solution to this problem is to abandon the commitment to larger groupings of items (the major lexical categories) and acknowledge that languages consist of an interconnected network of smaller items (constructions) instead (Croft 2001b). This approach has the major advantage of sidestepping unproductive debates about the existence or unity of particular lexical categories in particular languages, and shifts the focus instead to understanding the relationships and patterns

among individual constructions. This is precisely what I propose to do for lexemes as well. If we abandon the idea that all the meanings associated with a form must be in some way grouped into lexemes based on their morphosyntactic contexts of occurrence, we sidestep unproductive debates regarding homonymy vs. polysemy, and can instead focus on the relationships and patterns among the various senses associated with that form—specifically, the nature of the semantic shifts that occur between uses of the form in different discourse functions.

In sum, idiosyncratic semantic shifts are not the problem for theories of lexical flexibility that they are often taken to be. Indeed, functional expansion wouldn't be possible if hearers weren't capable of determining the meaning of a form when used in even highly unusual contexts. Innovative uses of words in new functions would be all but impossible, providing no opportunity for such innovations to receive broader adoption in the linguistic community. Each time a hearer encounters a novel use of a lexical item for the first time, they must accomplish the difficult task of discerning its meaning. This is no less true for flexible words as it is for non-flexible words, or for words whose meaning is predictable vs. unpredictable. In a certain sense, *every* use of a word is an instance of functional expansion, because every use of a word is always in a slightly different discourse and social context than the one before. The meaning of a word in a given context is highly socially and situationally dependent, and that context can change completely from one utterance to the next. Every token of a word thus necessarily appears in a new pragmatic context, and that pragmatic context slightly shapes its meaning. Language use is *is* language change. Semantic shift is therefore an integral and ubiquitous part of language use; the question is simply the degree of that semantic shift.

2.4 Functional approaches

By definition, functionalism as an approach to linguistic explanation is multifaceted. It looks to factors outside of the structural form of language as an explanation for that form—most

especially cognition, usage effects from frequency, and information structuring in discourse (Croft 2001a: 6323–6324). A functional approach to lexical categories is one that utilizes these explanatory elements. In this section I present Croft's (1991; 2000; 2001b) functional theory of lexical categories, which explains crosslinguistic patterns in the coding of reference, predication, and modification as arising from the interaction between our mental categories and the needs of discourse. I then use this theory as a framework for defining lexical flexibility in Section 2.5. I begin with a brief discussion of prototype theory as it pertains to lexical categories (§2.4.1), before expounding upon typological markedness theory (§2.4.2).

2.4.1 Prototype theory

It has long been recognized that the categories of human cognition are prototypal. In a series of studies, Eleanor Rosch and colleagues demonstrate that category membership is a matter of degree, and that there are better and worse representatives of any given mental category (E. Rosch 1973; E. H. Rosch 1973; E. Rosch 1975; Rosch & Mervis 1975; Rosch et al. 1976; E. Rosch 1978). Prototype theory was then popularized in linguistics by Lakoff (1987), Langacker (1987), Taylor ([1989] 2003), and Croft ([1990] 2003; 1991), among others.

The evidence for prototype effects is robust (Taylor 2003: 46–47). When asked to rate whether an item is a good example of a category, participants consistently rate prototypical members are better examples of the category than non-prototypical ones. In listing experiments where participants are asked to list members of a category, prototypical members are listed earlier and more frequently than non-prototypical members. Finally, prototypical members of a category are identified by participants as being members of the category more quickly than non-prototypical members. Each of these effects is scalar, such that individual members of a category sit anywhere on a scale of more or less prototypical.

Linguistic constructions are also subject to prototype effects (Taylor 2003: Ch. 12). Hopper & Thompson (1980), though not yet working in a prototype framework, nonetheless demonstrate that transitivity is very much a prototype category, with individual clauses showing

greater or lesser degrees of transitivity depending on their features. Ross (1972) shows that lexical items are graded in their ability to undergo various transformations, with human beings being close to prototypical noun phrases, while inanimates, events, abstract concepts are quite atypical. Taylor (2003: §12.5) likewise points out that the transitive construction in English has steadily expanded its functions over time "to encode states of affairs which diverge increasingly from prototypical transitivity" (Taylor 2003: 235). The result of this diachronic development is significant gradation as to which verbs now lend themselves to transitivization. Taylor (2003: 236) gives the example of the transitive construction being used to imply a semantic path, in lieu of an explicit preposition. Compare the pairs of English sentences in (30).

(30) English (Indo-European > Germanic)

Preposition	*Transitive*
He regularly **flies across** the Atlantic.	He regularly **flies** the Atlantic.
He **swam across** the Channel.	He **swam** the Channel.
She **swam across** our new swimming pool.	?She **swam** our new swimming pool.
We **drove across** the Alps.	?We **drove** the Alps.
The child **crawled across** the floor.	*The child **crawled** the floor.

(Taylor 2003: 236)

These examples illustrate that there are indeed better and worse members of the English Transitive Path construction.

Individual lexemes are also a type of construction, and therefore also subject to prototype effects. This is unsurprising since language forces speakers to map a non-discrete cognitive representation of the world onto discrete linguistic entities—we are forced to cut up and categorize the world around us into discrete objects and events/states so that we can refer to them and predicate statements about them. Reality, however, is not so neat. The result of this mapping is a linguistic form that imperfectly demarcates a portion of our mental world, centered on a clear prototype but with imprecise boundaries. Using a topological metaphor, we typically call some portion of our mental representation of the world a *semantic space* (Finch 2003: 140), and that space can be graphically represented using a *semantic map* (Croft

2001b: §2.4.3; Haspelmath 2003). Though semantic maps are most often used to represent a *functional* space for grammatical morphemes, they are equally applicable to lexical spaces as well. Gries (2006: 74) provides one such semantic map for the meanings of the English word *run*, shown in Figure 2.4, based on a comprehensive corpus analysis. Bowerman & Choi (2001: 485) present a semantic map of spatial relations on the basis of data from 38 languages (25 families), with a relation indicating prototypical support from below (ON) at one end and a relation indicating prototypical containment (IN) at the other. As pictured in Figure 2.5, words in different languages cut up this semantic space in different ways.

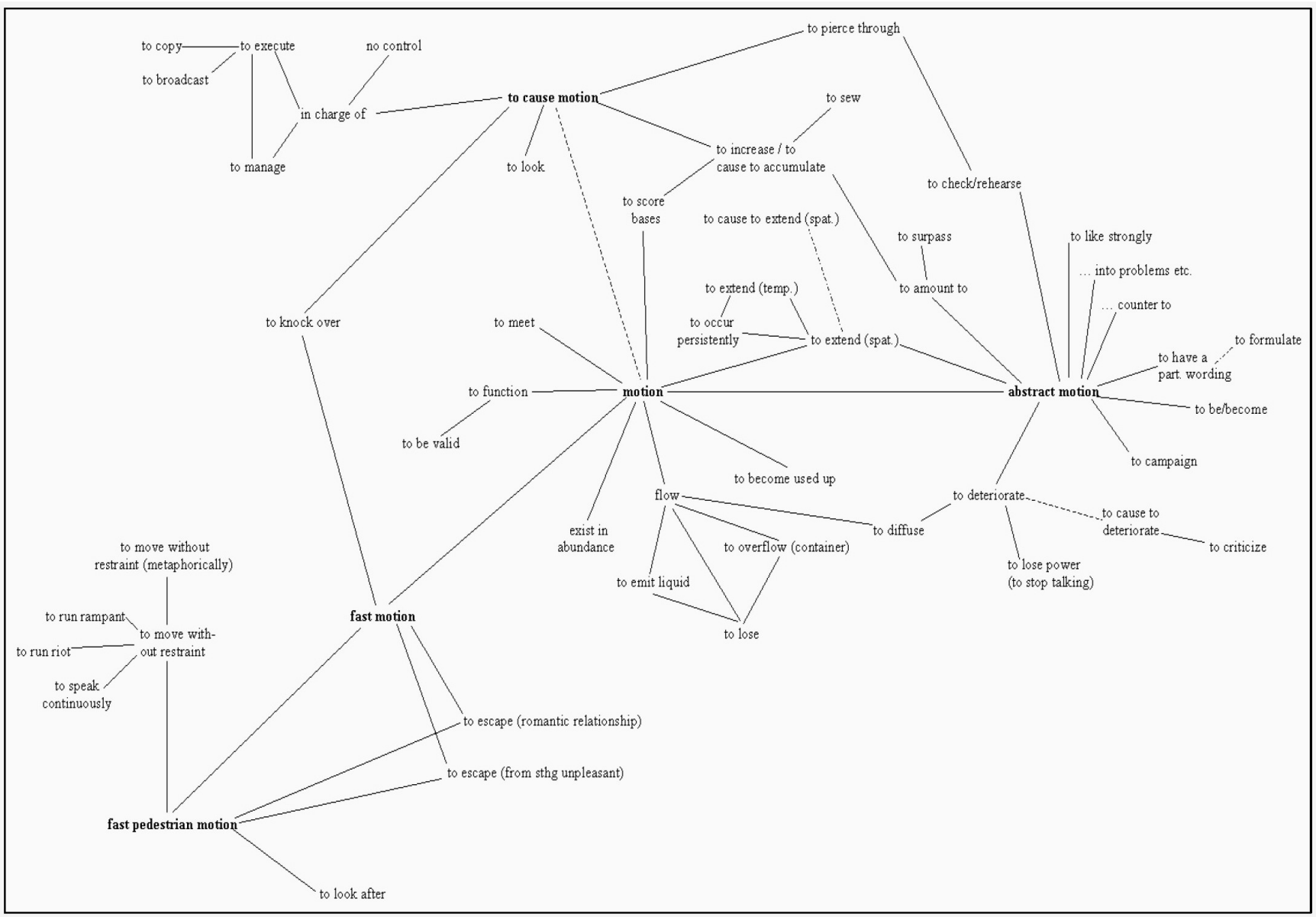

Figure 2.4: Semantic map of English *run* (Gries 2006: 74)

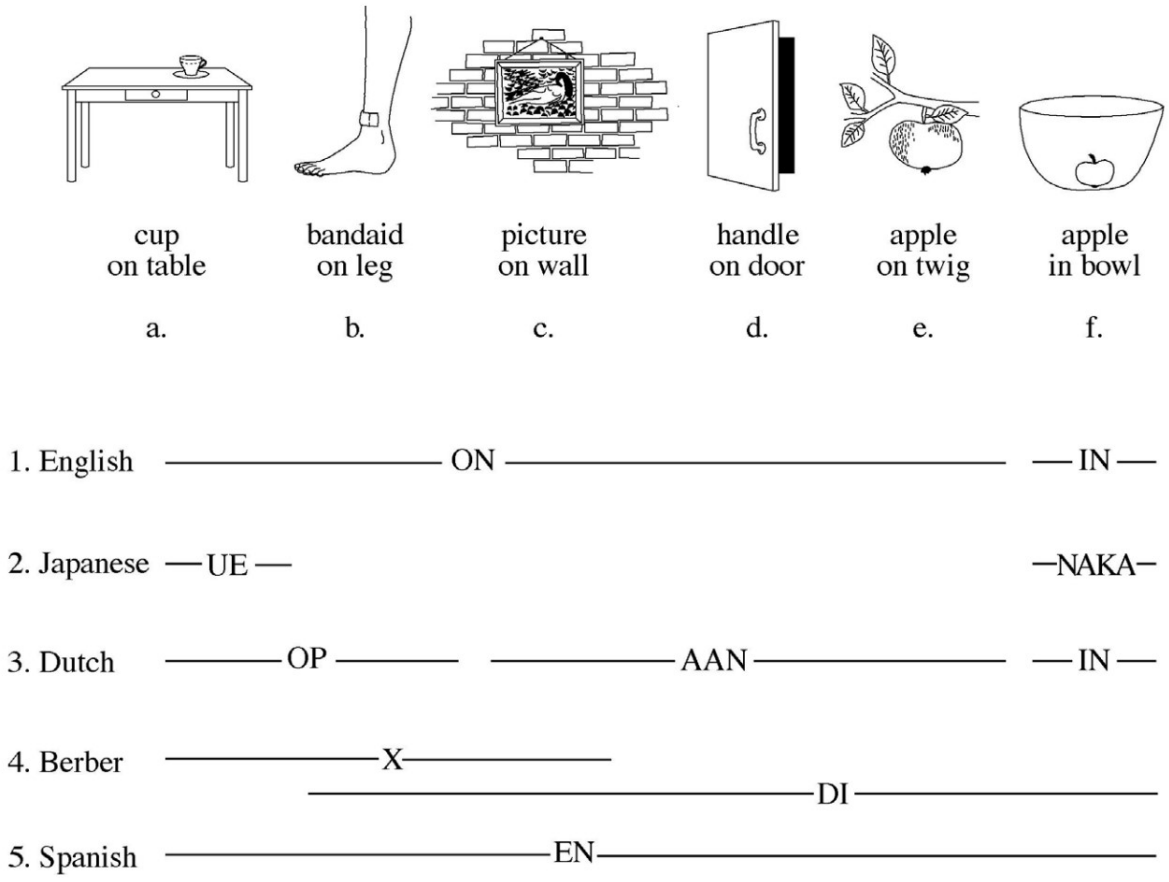

Figure 2.5: Crosslinguistic differences in the encoding of spatial relationships (Bowerman & Choi 2001: 485)

These examples illustrate that word meanings are polycentric and cover a range of possible uses, as mentioned in Section 2.3.1.4. Some of these uses may be more prototypical than others. The English expression *apple on a twig* is a slightly less prototypical use of *on* than *apple on a table*. The fact that words cover a range of uses, and that some of these uses are more protoytpical than others, is an important component of the typological markedness theory of lexical categories.

Even the formal categories that linguists use to describe linguistic structure tend to be prototypal (Taylor 2003: xii, 201). Taylor (2003: §11.1) argues that linguists' conceptions of the formal labels *word*, *affix*, and *clitic* are prototypal in nature, with better and worse members of the category. Haspelmath (2005) likewise shows that simple structural definitions of these categories are inadequate, and reframes the word–affix continuum in functional terms instead.

Much research in the Canonical Typology framework (Corbett 2005) also demonstrates the prototypal nature of linguists' categories. Though Corbett is careful to distinguish between a *canon* and a *prototype* / *exemplar* (Corbett 2010: 142), his accumulated work nonetheless shows that linguists view phenomena in the world's languages as better or worse instances of various descriptive categories.

What type of category are lexical categories then? Are word classes categories of human cognition, categories within particular languages, categories of languages generally, or analytic categories of linguists? Or some combination of these? Typological markedness theory posits that parts of speech like noun, verb, and adjective are not categories of particular languages. Languages have constructions, not parts of speech. Speakers, however, have *mental prototypes* of objects, actions, and properties. And although there is no *singular* Noun construction in English that would correspond to the mental category of OBJECT, there are numerous constructions in English which have the function of indicating *reference to an object*, such as the Definite Article construction or the Transitive Subject construction. Likewise, there is no one construction—in English or any language—that can be definitively called the Verb construction or the Adjective construction, but there are plenty of constructions which have the function of predicating or attributing properties. Naturally, then, speakers are more likely to use referring constructions when talking about something which they mentally categorize as an object, predicating constructions when talking about something they conceive of as an action, and modifying constructions when talking about something they conceptualize as a property.

Speakers' conceptualizations, however, are fluid. Speakers often conceptualize things in non-prototypical ways. They may construe events as bounded entities that they can refer to, or objects as properties with duration. As a result, speakers often use words in constructions that do not align particularly well with the word's meaning, such as the appearance of an action word like *sing* in a referring construction like the Gerund in the phrase *his singing was beautiful*. When speakers use words in this atypical manner, those words are

much more likely to be marked in some way—whether morphologically, behaviorally, semantically, or frequentiallyn (Croft 1991: §2.2). As a consequence of this tendency, clear asymmetries emerge between the prototypical vs. non-prototypical uses of object words, action words, and property words. It is the unmarked use of these words that most closely aligns with linguists' traditional conceptions of noun, verb, and adjective. Parts of speech as traditionally conceived are nothing more than the emergent effects of our cognitive prototypes on language. They do not have any real status in grammar or individual grammars. This is the fundamental idea behind typological markedness theory. Section 2.4.2 lays out this theory in more detail.

A last clarifying point is in order. Recognizing the existence of prototype-based categories, many linguists have described parts of speech as prototypal. Dixon & Aikhenvald (2004: 1–2), for example, says that the word classes noun, verb, and adjective each have a "prototypical conceptual basis" and "prototypical grammatical functions". Taylor (2003: 217) states, "A prototype view of NOUN entails that some nouns are better examples of the category, while others have a more marginal status." But languages have constructions, not parts of speech, and individual constructions are not gradient (Croft 2007). What linguists are in fact observing when they say that parts of speech are prototypal is not gradation in *linguistic categories* like noun, verb, and adjective (since those are not categories of particular languages), but rather gradation in the *mental categories* of objects, actions, and properties, which do indeed exhibit prototype structures, and which therefore have emergent effects on the organization of constructions in languages.

2.4.2 Typological markedness theory

I have already previewed various aspects of typological markedness theory at different points in this thesis. In this section I present a concise overview of the specific claims made by this theory, and some of the evidence for those claims. The phrase *typological markedness* or *typological markedness asymmetries* simply refers to an implicational universal regarding the

behavior of basic versus non-basic members of a conceptual category. At its simplest, the theory posits that less basic or prototypical members of a category are marked in some way; basic or prototypical category members are unmarked by comparison (Greenberg 1966). This *cognitive* markedness is then realized *linguistically* in a number of ways. The marked member of a category *may* be literally marked with some kind of affix or other overt morphological indicator, but this is just one of the ways an item can be a marked member of a category. The marked member of a category may also be less frequent, or have a smaller range of inflectional / distributional possibilities, or be semantically more complex. It is important to emphasize that *typological* markedness does *not* always entail *formal* markedness. Typological markedness is an *implicational* universal rather than an *absolute* universal. The more marked members of a category must be *at least as marked* as the unmarked member, but this does not preclude the possibility of all members being *equally* marked. Formal markedness is merely an emergent tendency of structures to reflect cognitive markedness.

As applied to word classes, typological markedness theory states that the most unmarked discourse functions for object, action, and property words are reference, predication, and modification, respectively. Therefore, when a lexical item is used for a function that does not align with its prototypical meaning, typological markedness theory predicts that it will marked. Again, it must be emphasized that not *every* instance of a lexical item being used in a non-prototypical function will be marked in comparison to its prototypical function; but it will always be *at least as* marked. This theory of typological markedness for the major discourse functions is laid out in detail by Croft in various publications (Croft 1991; 2000; 2001b; Croft & van Lier 2012). It is also important to understand that typological markedness theory is *not* a theory of parts of speech in the sense of large partitionings of the lexicon into categories like noun, verb, and adjective. Instead, noun, verb, and adjective are epiphenomenal, crosslinguistic markedness patterns that arise from the interaction of semantic prototypes (object, action, property) and their use in different discourse functions (reference, predication, and modification). They are not categories of particular languages.

Throughout this thesis, I have used the term *discourse function* to refer to the functions of reference, predication, or modification. These are what Croft (1991: 51) calls *pragmatic functions* or *propositional act functions* following the tradition of pragmatics and speech act theory in philosophy (Austin 1962; Searle 1969). These three functions are taken as fundamental to human communication, arising out of the communicative intent behind what speakers are actually attempting to *do* with language. This perspective was articulated early on by Sapir:

> There must be something to talk about and something must be said about this subject of discourse once it is selected. This distinction is of such fundamental importance that the vast majority of languages have emphasized it by creating some sort of formal barrier between the two terms of the proposition. (Sapir 1921: 87)

A similar point is made by Croft while articulating his theory of typological markedness as applied to lexical categories: "[n]o matter how complex a given situation is in terms of the number of entities involved and the number and kinds of relations that hold between them, a human being attempting to describe it in natural language must split it into a series of reference-predication pairs[.]" (Croft 1991: 124)

Modification is generally seen as less central a function than reference and predication, as illustrated by its lack of mention in the quotes above. For example, Hengeveld (1992: 55) takes the reference-predication dichotomy to be fundamental, yielding the major categories of noun and verb, while the modification function then combines with these two functions to yield the major categories of adjective and adverb, respectively. The primacy of the reference-predication distinction also appears to be reflected structurally in the world's languages, which do not always have dedicated means for encoding modification, but appear to always have constructions dedicated to reference and predication.

Croft (1991: 123) defines the pragmatic functions in terms of their discourse functions, following work in the discourse-functional tradition (W. L. Chafe 1976; Hopper & Thompson 1984; W. L. Chafe 1987; Du Bois 1987). Previous research defines *referents* as "discourse-manipulable participants" (Hopper & Thompson 1984: 711; Kibrik 2011), *predicates* as reported events (Hopper & Thompson 1984: 726), and *modifiers* as a mix of these two functions

(Thompson 1989). Croft (1991: 123) synthesizes ideas from this body of research and offers the following revised definitions instead:

- the act of *reference* identifies a referent and establishes a cognitive file for that referent
- the act of *predication* ascribes something to a referent
- the act of *modification* enriches the cognitive image of the referent with an additional feature

The particular pragmatic function chosen for any given mention of a concept is then just a matter of how the speaker chooses to portray or construe that particular concept—whether as a referent, predicate, or modifier (Croft 1991: 100); as Croft & van Lier note, "apparent instances of 'fuzziness' are actually variable construals" (Croft & van Lier 2012: 63).

With this understanding of discourse functions in mind, we can restate the thesis of typological markedness theory as applied to lexical categories: Noun, verb, and adjective are epiphenomenal markedness patterns that arise from the use of different semantic prototypes (objects, actions, and properties) in different discourse functions (reference, predication, modification). Uses of these semantic classes in non-prototypical functions are typologically marked. As mentioned, there are four ways in non-prototypical uses can be marked: structurally, behaviorally, semantically, and/or frequentially.

The first type of marking, *structural coding* or *formal marking*, refers to the fact that non-prototypical uses of lexical items are at least as formally marked as prototypical ones. Structural coding in this context refers specifically to "dedicated formal markers in a specific language that indicate a lexeme's syntactic function" (Croft & van Lier 2012: 62). Figure 2.6 is a schematic representation of some of the formal realizations of these markedness patterns. In indicates the different morphosyntactic means that languages tend to develop for marking each of the non-prototypical uses of words. For instance, participle constructions are one way that languages have of indicating the non-prototypical case of an action word being used for modification.

		FUNCTION		
		reference	**predication**	**modification**
MEANING	**object**	prototypical noun	predicate nominal copula	genitive adjectivalization PP on noun
	action	action nominal complement infinitive gerund	prototypical verb	participle relative clause
	property	deadjectival noun	predicate adjective copula	prototypical adjective

Figure 2.6: Typological prototypes for noun, verb, and adjective (adapted from Croft (2000: 89) and van Lier (2012: 62))

The second way in which non-prototypical uses of words can be marked is in terms of their *behavioral potential*, that is, the range of combinatorial possibilities for that lexical item. This is most clearly illustrated with an example from inflection: in many languages, property words used in predicate constructions are limited in their inflectional possibilities. In Munya, for example, property words functioning as predicates cannot inflect for person and number of the subject, and cannot take the imperfective marker, perfective marker, or direct evidential marker (Bai 2019: 96–97). The only grammatical markers allowed in property predication clauses are the stative aspect marker, a clause-final particle, and an egophoric marker. Hopper & Thompson's (1984) study of the discourse functions of different parts of speech is largely a study of behavioral potential. They conclude that "the closer a form is to signaling this prime [prototypical] function, the more the language tends to recognize its function through morphemes typical of the category—e.g. deictic markers for [Nouns], tense markers for [Verbs]." (Hopper & Thompson 1984: 703, abstract). Croft advances a cognitive explanation for these behavioral markedness patterns:

> In general, only the core members of the syntactic category will display the full grammatical behavior characteristic of their category because only they have all the semantic characteristics that the characteristic inflections tap into. This is to say that the inflectional categories of the major syntactic categories have been "tailored" to their semantically core members. This is an example of a processing constraint: languages inflect only for those properties that are of relevance to core members of the category; they do not

> inflect for properties of peripheral members of the category that are not of relevance to the core members of the category. (Croft 1991: 86)

Non-prototypical uses of words may also be marked semantically by a *semantic shift* in their meaning towards the semantic class prototypically associated with the discourse function they are found in (Croft 2000: 96; 2001b: 73; Croft & van Lier 2012: 68). I have already discussed the semantic shifts that occur in functional expansion in some detail in Section 2.3.3.2. Croft (1991: 60–61) makes the even stronger claim that non-prototypical uses of words will *always* be marked semantically, making semantic markedness an absolute rather than implicational universal.

These semantic shifts are caused by a combination of conventionalization and *coercion*, wherein the meaning of the construction is imposed on the meaning of the lexical item (Pustejovsky 1991; Croft 1991: 69, 108; Panther & Thornburg 2007: 252; Audring & Booij 2016). For example, predicate nominals (wherein an object word is used in a predicate construction) involve coercion from denoting an object to denoting classifying or equational relations (Croft 1991: 69). In Nuuchahnulth, for example, nominal predicates are always semantically durative and interpreted as either existential, classifying, or identifying expressions (Nakayama 2001: 47).

The final way in which words used in atypical functions may be marked is in terms of their frequency. Croft (1991: 59, 87) also refers to this as *textual markedness*. Frequential markedness predicts that lexical items are used more frequently in their prototypical functions than in non-prototypical ones. This means that object words should be most frequent in their use in referring constructions, and that referring constructions should most frequently denote objects (Croft 1991: 87).

The field of linguistics has accumulated a good deal of empirical evidence in support of the typological markedness theory of lexical categories. Croft (1991) provides empirical evidence from 12 languges for each of these markedness patterns. Dixon (1977) also provides evidence of typological markedness patterns as they relate to property words, using a com-

bination of structural and behavioral evidence. As mentioned, Hopper & Thompson's (1984) study also provides empirical support from a variety of languages for markedness in terms of behavioral potential. Stassen (1997) is a massive study of intransitive predication in 410 languages, demonstrating the marked behavior of non-action words when used in predicate constructions.

Having explicated the basic tenets of typological markedness theory, I now turn to reframing the concept of lexical flexibility in a way that utilizes this framework.

2.5 Lexical flexibility: A functional definition

Within the framework of typological markedness asymmetries, lexical flexibility can be understood as follows:

lexical flexibility The use of a lexical item (root, stem, or inflected word) in more than one discourse function (reference, predication, or modification) with no difference in structural coding.

This definition qualifies as a valid *comparative concept* in the sense of Haspelmath (2010a), because it is couched in terms of universal *functions* rather than language-specific *structures* (Croft 2016). It also has the advantage of being intentionally equivocal with respect to the lexical and cognitive unity of the item, and with respect to the linguistic level (root, stem, or inflected word) at which the flexibility is realized. In some cases when a single lexical form appears in more than one discourse function, speakers may have a close cognitive association between the two uses. This is most likely the case for the predicative and referential uses of the word *run* in the phrases *I run every morning* and *I'm going for a run* respectively. In other cases, speakers may have little to no awareness of the diachronic connection between uses of a form. For example, the use of *run* in the sense of *to run a print job* is extremely distant from the prototypical "fast pedestrian motion" sense in the semantic network for that form (Gries 2006: 74; see also Figure 2.4). It is unlikely that these two senses are closely cognitively connected

by most speakers, despite the fact that they both share a predicating function. The definition of lexical flexibility given here allows for any degree of semantic shift. Croft admits of this possibility explicitly: "It of course a priori possible to construct a typological classification of parts-of-speech systems using only structural coding and allowing any degree of semantic shift." (Croft 2001b: 68) Of course, I am not concerned here with constructing a classification of parts of speech—quite the opposite, in fact. This definition of lexical flexibility is intended to delimit precisely the cases where a language does *not* provide formal indicators of discourse function.

Allowing for any degree of semantic shift does *not* imply that semantic shift is in any way unimportant for understanding lexical flexibility. On the contrary, semantic shift is a key component of the process of functional expansion that leads to flexibility in the first place (see below). Moreover, carefully circumscribing the phenomenon of lexical flexibility without regard to the degree and type of semantic shifts involved puts us in a position to then compare the semantic shifts that occur in cases of lexical flexibility with those that occur in cases of overt derivation. This raises the intriguing question of whether semantic shifts in flexible cases differ in principled ways from overt derivation. Mithun (2017: 165) shows that for Central Alaskan Yup'ik the types of semantic relationships between flexible uses of words mirror those between basic and derived words. This would suggest that functional expansion follows the same principles as overt derivation. However, much more research is needed in this area.

As we have seen, a great abundance of evidence also shows that the meaning of any given combination of form and discourse function is a matter of convention, and often highly idiosyncratic (§2.3.2.4; §2.3.3.2). This fact suggests that flexible items are not truly "flexible" in the sense that speakers can use any lexical item for any discourse function and expect hearers to be able to infer their meaning from context. We know that item-specific gaps in usage exist. Certainly, novel cases of forms being used in new discourse functions do occur, or else it would not be possible for functional shift to happen in the first place. But these

cases are necessarily restricted by the cognitive limits on our ability to deal with ambiguity. If it were truly the case that any lexical item could be used in any discourse function at any time, it would barely be possible for hearers to interpret the intended pragmatic effects of each word. Instead, flexibility must rely on a degree of *conventionalization*. Conventionalization in turn implies *time*—conventionalization is a diachronic process. Thus, *lexical flexibility is best understood as a synchronic pattern resulting from the diachronic process of functional expansion*, where functional expansion is defined as follows:

functional expansion A diachronic expansion in the use of a lexical item (root, stem, or inflected word) into a new discourse function (reference, predication, or modification) with no additional structural coding.

Cases of lexical flexibility therefore arise whenever a new combination of form and discourse function is conventionalized in a community of speakers. This understanding of lexical flexibility is in line with cognitive research on lexicalization and constructional change. Functional expansion occurs because of speakers' need to construe concepts in different ways—as objects, actions, or properties. The semantic shifts that occur during functional expansion are then the result of coercion by the new constructional context, and the resultant meaning then becomes conventionalized as the meaning of that particular form in that particular discourse function (Croft 1991: 108).

If lexical flexibility is the result of a diachronic process, it should be possible to enumerate some of the specific pathways which give rise to it. Here I will mention just a few. One pathway is insubordination, whereby subordinate clauses in a language are reanalyzed as main clauses (Evans 2007; Mithun 2008; Evans & Watanabe 2016) (see also §2.3.2.2). Insubordination frequently results in formal similarities between noun phrases and verb phrases, and this formal ambiguity can abet the functional expansion of lexical items from referential to predicative uses and vice versa.

A second pathway to lexical flexibility is relexicalization (or more precisely, reconventionalization). This is the process that occurred in the case of morphological verbs being

reanalyzed as nouns in many North American languages (see §2.3.2.3) and certain English plurals like *brethren* or *arms*. In these cases, the conventionalized meaning associated with the form changed (e.g. from Cayuga 'it hauls logs' to 'horse'), so that the meaning more closely reflected its new discourse context.

A third pathway is topicalization, exemplified in the Wakashan family. Jacobsen (1979: 122, 142) observes the formal similarity between the Definite Article and the Third Person Singular Indicative markers in Wakashan languages, and argues for a diachronic connection between the two. It is likely that cleft constructions such as 'it was the dog that ran' became so common that speakers started to reanalyze the topicalized cleft as a definite noun phrase, 'the dog', thereby creating a formal similarity between referring expressions and predicating expressions.

Each of these pathways results in the functional expansion of lexical items into new discourse contexts with no new overt structural coding. Of course, functional expansion can also occur without any other accompanying grammatical changes. This happens in any instance where speakers simply use stems in new discourse functions. Lexical flexibility is the natural and expected result of the fact that non-prototypical uses of words are *not* always structurally marked—as allowed for by the fact that typological markedness is implicational and not absolute—even if they are marked in other ways. The use of additional structural coding in cases of functional expansion is not obligatory, but merely a statistical tendency. Lexical flexibility occupies the theoretical space where structural coding asymmetries fail to apply.

When viewed in this light, *lexical flexibility is not so much of a problem as it is a design feature of language*. The presence of lexical flexibility should be *expected* in every language, not treated as exotic. The cognitive-typological approach outlined in this chapter inverts the lexical flexibility question: the interesting question is not why some languages fail to make distinctions in parts of speech (thereby framing lexical flexibility as a *deficit*), but rather why languages develop specialized constructions for different discourse functions in the first

place (see Gil [2012] for an attempt to answer this question for predication). Lexical flexibility exists in any area of the grammar where specialized function-indicating morphology has yet to develop. Flexibility should therefore be considered the default state of affairs for language. Gil (2005; 2006) has in fact argued, partially on the basis of data from highly flexible languages, that early human language must have been *isolating-monocategorial-associational* before the development of dedicated function-indicating morphology.

The idea that the "natural state" of language is monocategorial or acategorial would seem to conflict with the point made above that lexical flexibility can result from diachronic processes, but the two positions are not mutually exclusive. Languages develop constructions which indicate different discourse functions, but languages are also subject to counteracting pressures. This is a classic case of competing motivations: on the one hand, the frequency with which speakers need to perform the discourse functions of reference, predication, and modification all but ensures the development of constructions dedicated to indicating those functions; on the other hand, speakers need to construe states of affairs in various ways—as objects, actions, or properties—creating pressures which have the potential to level those formally marked distinctions. Reconventionalization and the reanalysis of cleft constructions could both be viewed as diachronic processes motivated by this latter pressure.

In sum, then, lexical flexibility is a natural result of the cognitive and diachronic forces at work in language. Defining lexical flexibility in terms of typological markedness (or more accurately, the lack of formal marking for otherwise marked uses) provides a crosslinguistically applicable definition of the phenomenon which avoids methodological opportunism while still recognizing that lexical flexibility requires some degree of semantic shift and conventionalization. With this definition in place, the remainder of this thesis turns to exploring the prevalence of lexical flexibility in English and Nuuchahnulth and the semantic behavior of words in cases of functional expansion.

Chapter 3

Data & Methods

This chapter describes the data used for this study, and how those data were analyzed. It covers the selection criteria for languages and lexemes, which corpora were used, and how the data were obtained and formatted. I also describe the methods used to annotate the data, and factors that influenced how the data were coded. I present and explain a measure of corpus dispersion that is used partly in place of, and partly as a complement to, raw frequencies of lexemes. Lastly, I set forth a procedure for operationalizing and quantifying lexical flexibility in a crosslinguistically comparable way. The formulation of this lexical flexibility measure is a key methodological contribution of this thesis.

Chapter 4

Results

This chapter details the findings of the procedures described in Chapter 3: Data & Methods. I begin with a brief examination of several representative lexical items from English and Nuuchahnulth, and explain to the reader how to interpret the ternary plots used to present results in this thesis. I then take an aggregate look at the behavior of lexical flexibility in English and Nuuchahnulth, first individually and then in comparison (R1). Next, I present the results of the investigation of the relationship between degree of lexical flexibility and frequency / dispersion (R2). Finally, I discuss the behavior of flexible items with respect to their semantics (R3).

Chapter 5

Conclusion

This chapter summarizes the methods and main findings of this study, and the considers the impliations of those results for theories of lexical categories. I argue that the data provide compelling evidence in favor of functional approaches to lexical categorization, most especially cognitive prototype theory and Croft's theory of lexical categories as typological markedness patterns. I also argue for a reversal of the canonical position on parts of speech: instead of working from the default assumption that all languages have clearly-defined or even loosely-defined parts of speech, we should begin from the understanding that dedicated referring, predicating, or modifying constructions develop diachronically, and that even when they do, they do not do so for the entire lexicon, or in all areas of the grammar equally. Even languages like English whose lexemes pattern strongly with the standard prototypes of noun, verb, and adjectives nonetheless exhibit varying degrees of flexibility for different lexemes. Lexical categories are not a given in grammar. I conclude by discussing some limitations of the present study and avenues for future research, followed by closing remarks.

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