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The Oxford Handbook *of* INFORMATION STRUCTURE

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OXFORD
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Abbreviations

1	first person
2	second person
3	third person
ABL	ablative
ABS	absolutive
ACC	accusative
ACCOMP	accomplished
ADVB	adverbalizer
AFFIRM	affirmative
AGT	agent
Alt	alternative
APP	applicative
A-quantification	quantification expressed by adverbs
ASL	American Sign Language
ASS	assertion
ATB	Across The Board
AUG	augment
AUT	autonomous
AUX	auxiliary
BAE	bare argument ellipsis
BCS	Bosnian/Croatian/Serbian
Bel	Belarusian
bF	bleached focus
BG	background
Bg	Bulgarian
BOLD	Blood Oxygenation Level Dependent
BPR	Background-Presupposition Rule
C	Complementizer

C	contextual parameter
CAP	counter-assertive polar focus
CAUS	causative
CC	context connect
CE	contrasting ellipsis
CF	contrasting focus
CG	Common Ground
CIR	CT interpretation Rule
CL	class
CL	clitic
CL/CLF	classifier
CLD	Contrastive Left Dislocation
CLLD	Clitic Left Dislocation
CnCL	conjunctive subject clitic
COND	conditional
Cop	copula
CPS	Closure Positive Shift
CQ	current question
CT	contrastive focus
Cz	Czech
D	determiner
DAN	dorsal attention network
DAT	dative
DEC/DECL	declarative
DEF	definite
DEM	demonstrative
DET	determiner
DF	domain of the focus
DGS	German Sign Language (Deutsche Gebärdensprache)
D-quantification	quantification expressed by determiners
DRT	Discourse Representation Theory
DTA	Deutsche Text Archive
D-tree	discourse-tree
D-type dislocations	Clitic Left/Right Dislocation or Contrastive Left Dislocation

DW	Deutsches Wörterbuch
eADM	extended Argument Dependency Model
EEG	electroencephalography
ENC	enclitic
ERG	ergative
ERP	Event-related Brain Potential
EVID	evidential
EXIST	existential
EXP	experiental
EXPL	expletive
ExplAlt(Set)	explicit alternative (set)
F	focus
F/FEM	feminine
F1	today future
F2	general future
FA	Function Application
FAT	Focus Accent Thesis
FC	first conjunct
FF	focus fronting
FI	Focus Intonation
fin	finite
FinP	Finite Phrase
FinSL	Finnish Sign Language
FM	focus marker
fMRI	functional magnetic resonance imaging
FMV	verbal focus marker
FOC	focus
FOF	First Occurrence Focus
fs	focus sensitive
FULL	full form
FUT	future
FV	final vowel
GEN	genitive
GME	givenness marking ellipsis

GPAD	Generalized Principle of Anaphoric Dependence
H	high tone
HKSL	Hong Kong Sign Language
HT(LD)	hanging topic (left dislocation)
IAA	inter-annotator agreement
IAV	immediately after verb
IBV	immediately before verb
ID	identity function
IL	individual level
IMP	imperative
IMPERF	imperfect
IMPF	imperfective
ImplAltSet	implicit alternative set
Ind	indicative
INDF	indefinite
INF/infin	infinitive
INFL	Inflection
INTER/INTERROG	interrogative
ip/IP/i-phrase	intonation phrase
IS	information structure
ISL	Israeli Sign Language
IT-operator	illocution type operator
L	low tone
LAN	left anterior negativity
LC	Locus Coeruleus
LEA	local excluded alternatives
LF	Logical Form
LIU	Jordanian Sign language (Lughatil-Ishaara il-Urdunia)
LOC	locative
LOT	Lexical Operator Thesis
LSB	Brazilian Sign language (Língua de Sinais Brasileira)
LTN	Lexical Term Nodes
M	masculine
Mac	Macedonian

MC	main clause
MI-S	metrically-interpreted syntactic
ML	machine learning
MMN	Mismatch Negativity
MRC	mental representation of what is being communicated
N	neuter
NBB	Northern Biscayan Basque
NC	nucleus carrier
NE	Norepinephrine
NEG	negative, negation
NGT	Dutch Sign language (Nederlandse Gebarentaal)
NIF	neutral information focus
NML/NMLZ	nominalizer, nominalization
NOM	nominative
NPA	Nuclear Pitch Accent
NPE	NP-ellipsis
NPI	negative polarity item
NS(R)	Nuclear Stress (Rule)
OBJ	object
ObjPrep	Object Preposing
OHG	Old High German
OP	alternative evaluating operators
OT	Optimality Theory
P	patient-like argument of canonical transitive verb
P	plural
P&P	Principles and Parameters
P&T	Pronouns & Traces
P1	today past
P2	yesterday past
PA	pitch accent
PA	Predicate Abstraction
PART	partitive
PASS	passive
PASTPART	past participle

PB	Proto-Bantu
PC	parallelism condition
PCL	clause final particle
P-COR	corrective focus with the corrigendum being presupposed background
PERF	perfect
PERF/PFV	perfective
PF	Phonological Form
PF	polar focus
PH	past habitual
PhP	phonological phrase
PL/P	plural
Pl	Polish
PM	Predicate Modification
POS	part of speech
POSET	partially ordered set
POSS	possessive
p-phrase	phonological phrase, prosodic phrase
PR.O	pronominal object
PRES	present
PROG	progressive
PROSP	prospective aspect
PROX	proximal/proximate
PRS	present
PRST	persistive
PRT	(discourse) particle
PST	past
PTCP	participle
q	contextually salient alternative to a modified proposition
QUD	Question Under Discussion
R	relator
RC	relative clause
RD	Right Dislocation
REFL	reflexive
Rel	relative

REP	reported/hearsay evidential
RFR	rise–fall–rise
RNR	right node raising
RSL	Russian Sign Language
RST	Rhetorical Structure Theory
Ru	Russian
RV2	restricted V2 construction
S	single argument of canonical intransitive verb
S	singular
SADV	sentence adverbial
SC	second conjunct
SCL	subject clitic
SDM	syntax-discourse model
SDRT	Segmented Discourse Representation Theory
SG	singular
SJCT	subjunctive
SL	sign language
SL	stage level
SLH	Strict Layer Hypothesis
Slk	Slovak
Sln	Slovenian
SOF	second occurrence focus
STAT	stative
SUBJ	subject
SUP	superessive
TAM	tense–aspect–mood
TOP	topic
TPE	TP-ellipsis
TRANS	transitive
TS	tone spreading
Uk	Ukrainian
UV2	unrestricted V2 construction
VAN	ventral attention network
VPE	VP-ellipsis

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CHAPTER 1

INTRODUCTION

CAROLINE FÉRY AND SHINICHIRO ISHIHARA

1.1 GOALS

INFORMATION structure (IS) refers to the structuring of sentences (*information packaging* in Chafe's 1976 terms) in different kinds of information blocks. IS is not only directly related to some of the central disciplines of linguistics (semantics, pragmatics, syntax, morphology, and prosody), but also to some of the extra-linguistic aspects such as interlocutors' psychological perception of the world.

This Handbook contains forty chapters discussing various theories and issues on IS, and aims to comprehensively cover the state of the art in one volume. It is designed as a guide to the theoretical and practical aspects related to IS, surveying what researchers have achieved so far, as well as raising outstanding questions that still need to be investigated. By bringing together this diversity of questions and this diversity of approaches, we hope to encourage our readers to explore different avenues of research in the future.

The volume is intended for a wide audience: graduate students, faculty, and researchers in all disciplines of linguistics who are interested in information structure and its effect on grammar as well as meeting the needs of linguists of all theoretical persuasions at graduate level and above. It will also be useful for cognitive psychologists, computational scientists, philologists, and philosophers.

Studies of IS face various kinds of challenges, which are rooted in one striking aspect of IS: its diversity. A first challenge is the diversity, or abundance, of theories and definitions of IS-related notions. There are countless definitions of basic IS notions and related theories that have been proposed in the literature. Many researchers use the same terminology to refer to different notions, or different terms are applied to the same concept. Choosing which definition to adopt in one's own study can be a first obstacle for starting work on IS-related issues. This volume aims to bring some clarity to the terminological confusion typical of new concepts and ideas. While there is an emerging consensus about many terms and notions related to information structure, some clarifications are still badly needed. In order to avoid unnecessary repetition of terminological confusion,

all the chapters in this Handbook adopt a uniform set of definitions, as summarized by Krifka (2008), as a starting point. Therefore, each chapter does not define these basic notions in depth. Only deviations from Krifka's definitions are discussed by the authors. Krifka's definitions of IS notions are summarized in this introduction (Section 1.3).

A second challenge is the diversity of IS grammatical reflexes. IS is expressed in different ways in different languages, and even within a single language, there is diversity of means. Focus (see Section 1.3.2 for the exact definition adopted in this Handbook), for example, can be expressed by phonetic/phonological means (pitch accents, metrical prominence, prosodic phrasing, pitch range expansion/compression, lengthening/shortening, etc.), by morphological/syntactic means (morphological marking, syntactic movement of focused material, word order manipulation of non-focal material, or specific focus-constructions such as clefts), and by semantic/pragmatic means (focus-sensitive operators and discourse particles, manipulation of pragmatic implicatures, and conversational maxims). There is no doubt that the great number of grammatical means is one of the major causes of the diversity of IS notions and definitions mentioned above. Furthermore, while the notions of IS refer to the formal and communicative aspects of language for the expression of information structural roles, IS is also closely related to psychological perception of the world and of the minds of the participants of the conversation. The notions of IS may therefore denote the extra-linguistic, cognitive, or mental states of referents, actions, locations, and temporality as well (see Kuno 1972; Chafe 1976; Prince 1981; Lambrecht 1994, and many others for this dichotomy).

A third aspect that makes IS study challenging is the methodological diversity found in studies of IS. In most (if not all) cases, linguistic and extra-linguistic factors of IS are not simply playing their roles independently. Rather, they are intricately interwoven. In order to disentangle substantial knots of relevant factors and fully understand the nature of IS-related phenomena, linguists need to approach IS-related linguistic phenomena from various interdisciplinary perspectives. A wide range of novel and interdisciplinary approaches, though certainly a desirable direction for the advance of a scientific field, may become an obstacle when one needs to survey the relevant literature in unfamiliar subfields. One of the aims of this handbook is to facilitate interdisciplinary investigation by introducing some of the methodological developments that have emerged in recent years, especially those that take experimental approaches.

A fourth challenge is the cross-linguistic diversity. Typological investigation is an essential part of IS studies. This Handbook introduces selected languages and language families to illustrate the breadth of cross-linguistic variation of IS expressions as well as variation within each language(-family).

The chapters in this volume are grouped into four parts, each of which addresses one of the challenges mentioned above. The thematic organization within each part of the volume reflects some of the principal fields of research and application in IS. As such, the volume can be read by focusing on specific aspects and parts. Also, each chapter contains cross-references to other chapters, so that the related discussions can be easily found within the volume.

This introductory chapter presents a theoretical background, including a short history of IS studies (Section 1.2), the definitions of IS-related notions adopted throughout the volume (Section 1.3), and brief summaries of each chapter (Section 1.4).

1.2   A SHORT HISTORY OF INFORMATION STRUCTURE

The point of departure for research on IS starts with Mathesius (1975), who published at the beginning of the twentieth century and founded the Prague Linguistic Circle. Mathesius is often credited as the father of modern IS, see for instance Lambrecht (1994).[1] Mathesius replaced the psycholinguistic terms 'psychological subjects' and 'psychological predicates' of von der Gabelentz (1869) with the notions of 'theme' and 'rheme', see also Daneš (1974a, 1974b) and Steedman (2000) for this terminology. According to Mathesius, theme is what the sentence is about, and rheme is what is being said about the theme. These terms easily translate into topic for theme and focus for rheme. Firbas (1964, 1966) developed the ideas of the Prague school further, and integrated them in a theory of dynamic communication: the theme is 'the sentence element (or elements) carrying the lowest degree(s) of C[ommunicative] D[ynamism] within the sentence', and the rheme is the important part of the sentence, that 'pushes the communication forward' (1964: 272). Halliday (1967–68) first used the term *information structure*. Focus is what is 'not being recoverable from the preceding discourse' (1967–68: 204). 'The newness may lie in the speech function, or it may be a matter of contrast with what has been said before or what might be expected' (1967–68: 206). Chafe (1976: 30) defined given (or old) information as 'that knowledge which the speaker assumes to be in the consciousness of the addressee at the time of the utterance' and new information as 'what the speaker assumes he is introducing into the addressee's consciousness by what he says'. Both Prince (1981) and Lambrecht (1994) were especially interested in the characterization of Chafe's notion of givenness and proposed elaborate hierarchies of givenness. Another branch of information structure was initiated by Marty (1918). He was inspired by the philosopher Brentano (1874) who discussed the categorical and thetic judgement types. A typical categorical judgement consists of a subject–predicate structure. First an entity is named and second a statement is made about it. Thetic judgements, by contrast, express an event, a state, or a situation, and are thus simpler than categorical ones. Kuroda (1972) revived this distinction by observing that they straightforwardly apply to Japanese expressions containing *ga* and *wa* respectively. In the last decades, the interest in information structure has grown immensely,

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[1] In chapter 33, É. Kiss also cites Sámuel Brassai (1860), a Hungarian linguist, who was interested in some aspects of word orders from the point of view of their givenness and newness (for which he used different terms). However, his work was never well-known outside of Hungary.

and this has lead to an extraordinary evolution of linguistic themes and ideas. Many authors have been crucial for the advancement of information structural theories, including von Stechow (1981), Jacobs (1983), Rooth (1985, 1992), Rochemont (1986), Erteschik-Shir (1997), Vallduví (1992), Steedman (2000) to cite only a few names, as can be gathered from the chapters of the volume.

1.3   Definitions

As a starting point, all the chapters in this handbook adopt the definitions of IS notions proposed by Krifka (2008). This section briefly summarizes Krifka's definitions of the basic IS notions.

1.3.1 Information packaging and Common Ground

Following Stalnaker (1974) and Reinhart (1981), Krifka (2008: 243) claims that information structure notions should be grounded in theories of how communication works: 'The basic notions of Information Structure (IS), such as Focus, Topic and Givenness, are not simple observational terms. As scientific notions, they are rooted in theory, in this case, in theories of how communication works.' To start the discussion of IS notions, Krifka (2008) follows Chafe's (1976) approach to IS by adopting the idea that IS should be regarded as the matter of *information packaging*, that is, how 'the speaker accommodates his speech to temporary states of the addressee's mind, rather than to the long-term knowledge of the addressee' (1976: 28). He discusses various 'statuses' of nouns (or noun phrases)[2] that are related to how the information is transmitted between participants of a discourse, in other words, how the content of the utterance is packaged by the speaker and sent to the addressee:

> I have been using the term packaging to refer to the kind of phenomena at issue here, with the idea that they have to do primarily with how the message is sent and only secondarily with the message itself, just as the packaging of toothpaste can affect sales in partial independence of the quality of the toothpaste inside. (Chafe 1976: 28)

According to Chafe, the speaker packages the information to be sent to the addressee according to the knowledge that he assumes is shared by the addressee. This shared knowledge is often called *Common Ground (CG)*, a term proposed by Stalnaker (1974, 2002). The CG forms the background of a conversation—the information that is mutually

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[2] Chafe (1967) limits his discussion to noun phrases. So does Reinhart (1981), in her discussion of aboutness topics (see Section 1.3.4). But see, for example, chapters 15 by Lohnstein (on verum focus) and 16 by Zimmermann (on predicate focus) for cases where non-nominal elements are focused.

known (or believed) to be shared by speaker and addressee—and to which new information is added. The idea is that a discourse proceeds in such a way that each utterance by the participants of the discourse updates the content of the CG. As a result, the CG is continuously modified in communication. The notion of CG also allows us to make a distinction between 'presuppositions, as requirements for the input CG', and 'assertions or the proffered content, as the proposed change in the output CG' (see Krifka 2008: 245).

Although Krifka agrees with Chafe in that IS deals with the way the message is delivered, Krifka further points out that IS not only deals with how to deliver the message, but also affects the content of the message itself. He therefore makes a distinction between what the content of the current CG is (*CG Content*), and how these contents should be developed in terms of the relevance to the current discourse (*CG Management*). This distinction allows us to 'associate those aspects of IS that have truth-conditional impact with CG content, and those which relate to the pragmatic use of expressions with CG management' (Krifka 2008: 246).[3]

1.3.2 Focus

The definition of focus is based on the theory of alternative semantics of focus proposed by Rooth (1985, 1992, chapter 2 of this volume). Focus assigned to a linguistic expression α always indicates that there are alternatives to α relevant in the current discourse. Putting it differently, anything that does not indicate any alternatives to α should not be called focus. This analysis allows various ways of focus marking, as there are various ways to signal the presence of alternatives, for example pitch accents, word order, specific syntactic constructions like clefts, etc. Krifka (2008: 247) defines focus as follows:

(1) Focus indicates the presence of alternatives that are relevant for the interpretation of linguistic expressions.

Focus may be used to influence either the CG content or the CG management. Krifka (2008) distinguishes between the two in terms of semantic vs pragmatic uses of focus. The semantic use of focus affects the truth-conditional aspects of the discourse, while the pragmatic uses of focus regulates how the CG of the discourse is to be updated by imposing pragmatic requirements on the discourse to fulfil the communicative needs of the discourse participants. For example, focus sensitive operators (see Beck, chapter 12 of this volume), such as *only, also*, and *even*, are always associated with focus to influence the truth-condition of the sentence in which they appear. The sentence *John only introduced Mary to Sue* may have different truth-conditions depending on the location of focus, which is indicated by pitch accents. In the context where John introduced Mary

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[3] See Velleman and Beaver (chapter 5) for a concise overview of this distinction, and Horn (chapter 6) for cases that lie around the border of this distinction.

to Sue and Bill (and didn't introduce anyone to anyone else), the sentence is true if the pitch accent is on *Mary*, but false if the pitch accent is on *Sue*.

The pragmatic use of focus regulates the direction to which the discourse is developing. A first example is the so-called question–answer congruence. A wh-question sentence requires a congruent answer sentence, thus adding a particular type of information to the current CG. In other words, a question 'changes the current CG in such a way as to indicate the communicative goal of the questioner' (Krifka 2008: 250). The answer sentence fulfils this communicative goal by expressing the required information to be added to the CG as the focus of the sentence. Other pragmatic uses are correction and confirmation of information, highlighting of parallel information, and delimitation of the utterance (cf. definition of contrastive topics below). Further discussions of CG management and related notions include 'question under discussion' (Velleman and Beaver, chapter 5), '(non-)at-issue'-ness (Horn, chapter 6), and 'presupposition' (Sæbø, chapter 7).

1.3.3 Givenness

The status of referents can be new (inactive at the point of their introduction into the discourse) or given (active in the consciousness of the interlocutors). According to Clark and Haviland (1977), given information is 'information [the speaker] believes the listener already knows and accepts as true', and new is 'information [the speaker] believes the listener does not yet know'. Givenness is divided into text-givenness (previously mentioned in the discourse) and context-givenness (contextually salient). Using the notion of CG, Krifka defines givenness as in (2).

(2) A feature X of an expression α is a Givenness feature iff X indicates whether the denotation of α is present in the CG or not, and/or indicates the degree to which it is present in the immediate CG.

This definition allows two different interpretations of givenness: givenness may be either a categorical feature (given vs not given, i.e. new), or a scale that expresses the degree of discourse salience, following two lines of theories of givenness (e.g. Schwarzschild 1999 for the former and Prince 1981, Gundel et al. 1993, Chafe 1976, and Lambrecht 1994 for the latter). Givenness may be part of the lexical information (as in pronouns, clitics, and definite articles), or arbitrarily assigned to linguistic expressions by means of various grammatical devices (such as deaccentuation, word order, and deletion). See chapter 3 by Rochemont for further discussion.

1.3.4 Topic

The notion of topic is related to the way information is stored in human memory and organized in communication. Krifka describes topic as follows: ' … topic is the entity that a speaker identifies about which the information, the comment, is given. This

presupposes that information in human communication and memory is organized in a certain way so that it can be said to be "about" something' (Krifka 2008: 265). He adopts the following definition of topic (often referred to as *aboutness topic*), which makes use of the notion of CG.

(3) The topic constituent identifies the entity or set of entities under which the information expressed in the comment constituent should be stored in the CG content.

This definition follows the proposal by Reinhart (1981), who uses the organization of a library catalogue as a metaphor for how topics and comments are related to the CG. The CG (for which she uses the term 'context set') is organized like a subject-oriented library catalogue, in which book entries (propositions stored in the CG) are organized according to their subjects (topics). A topic is like a subject in the catalogue, according to which book entries are collected in a single file card. Each time a new book entry (a new proposition) is added to the catalogue (the current CG), the topic specifies the file card to which the book entry is to be added.[4] (But see also Roberts 2011 and Büring, chapter 4 of this volume, for the difficulties of defining topic.)

Based on this definition, Krifka also discusses the interaction between topic and focus to define *contrastive topics* (see also Büring, chapter 4 of this volume). He claims that a contrastive topic contains a focus, which induces a set of alternatives within a contrastive topic and indicates the presence of other topics relevant for the current CG. The presence of alternatives indicates that there are other topics and their comments that may be added to the CG. In other words, a contrastive focus can imply the presence of further information to be added to the CG.[5]

1.4 Organization of the Handbook

As mentioned in Section 1.1, this Handbook is divided into four parts, each reflecting a type of diversity found in IS studies: Part I *Theories of information structure*, Part II *Current issues on information structure*, Part III *Experimental approaches to information structure*, and Part IV *Language studies on information structure*. In order to comprehensively review each thread of research that seemed important for a coverage of all aspects of IS, we selected what we thought were major topics and fundamental issues

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[4] Morphosyntactically, topics may be presented via various strategies: specific syntactic position(s) (see, for example, Aboh, chapter 8, Surányi, chapter 21, É. Kiss, chapter 33, Chen, Lee and Pan, chapter 36, for relevant discussion), dislocations (López, chapter 20, Poletto and Bocci, chapter 32, Skopeteas, chapter 34), morphological marking (Tomioka, chapter 37, Michaud and Brunelle, chapter 38), or certain word order configurations (Neeleman and van de Koot, chapter 19, Fanselow, chapter 31).

[5] But see Repp (chapter 14) for further discussion on the notion of 'contrast'. Also, see Krifka for two related notions: *frame setting* and *delimitation*.

and assigned them a chapter each. In planning the specific contents and structure of the volume, our goals were to gather a wide range of perspectives, across subfields, languages, and disciplines, and to highlight the complementarity of approaches and backgrounds. Inevitably, however, theoretical approaches and empirical facts are interwoven, and are often addressed in more than only one chapter. And conversely, some important aspects of IS may not be fully represented in this volume, which is also inevitable to a certain extent given the breadth of the range of IS-related phenomena. When some topic or phenomenon could not be included in a chapter due to space limitation, however, authors were asked to provide references to relevant literature. In the remainder of this section, a general overview of each chapter is provided.

1.4.1   Part I: Theories of information structure

Part I comprises an overview of various linguistic theories of information structure in semantics, pragmatics, morphosyntax, and phonology. The first three chapters of this section provide a comprehensive overview of the basic notions of information structure: *focus, givenness*, and *topic*. These first chapters take a semantic perspective, and lay the ground for the following chapters. In chapter 2 (*Alternative semantics*), Mats Rooth defends the idea that 'the semantics of the language makes available, in addition to an ordinary semantic value (which is a proposition in the case of a clause), a set of eligible alternatives, which for a clause is a set of propositions. The set of alternatives is a "focus semantic value", or "alternative semantic value"'. After reviewing empirical applications of the alternative semantic theory of focus, he explicates how focus is interpreted and how alternatives are composed in this theory. He also discusses an alternative theory by Schwarzschild (1999) as well as Büring's (1997) extension of the theory to contrastive topics. But he refutes the idea that the notion of 'focus' can be assigned a single definition. There may be 'several different theoretical notions of focus', depending on the language and the phenomenon under discussion. According to Michael Rochemont's chapter 3 (*Givenness*), the notion of givenness, which he discusses in relation to the notion of *salience*, is related to the notion of CG management rather than that of CG content (see Krifka 2008 and above for this distinction). He examines deaccenting in English and comes to the conclusion that 'failure to deaccent when to do so would be consistent with speaker's actual communicative intent misleads interlocutors to think the speaker must have some other intent'. This can be illustrated with Lakoff's (1972) famous sentence *John called Mary a Republican and then SHE insulted HIM*. If *insulted* is not deaccented, then it may be assumed that the speaker does not consider that calling somebody a Republican is insulting. And he proposes that even under a precise definition of givenness, focus cannot be entirely eliminated. Daniel Büring's chapter 4 ((*Contrastive*) *Topics*) specifies an analysis of contrastive topics as an extension of alternative semantics for focus: 'CT [contrastive topic] marking results in a set of alternative propositions which are explicitly *not* used for exhaustification'. A sentence containing a contrastive topic and a focus must not be a complete answer to the question under

discussion. Büring also makes a plea for eliminating non-contrastive topics, which according to him, do not consist in a coherent type of linguistic phenomena.

Chapters 5 to 7 introduce theories of information structure in pragmatics and discourse analysis. In chapter 5 (*Question-based models of information structure*), Leah Velleman and David Beaver present a Question Under Discussion model of discourse and information, following a proposal by Roberts (2012). This model uniformly treats focus as a pragmatic notion, and explains its function by developing discourse structures based on questions implicitly or explicitly indicated by focus. They discuss the notion of 'relevance' of utterances and of 'congruence' of answers to questions in assessing a model in terms of a range of constraints that relate IS to discourse structure. Chapter 6 by Laurence Horn (*Information structure and the landscape of (non-)at-issue meaning*) explores issues around the border between semantic entailment and pragmatic implicature, or between CG content and CG management, from the perspective of at-issueness. Among other things, Horn shows that exhaustivity in structural focus constructions like clefts (as in *It was a pizza that Mary ate*) belongs to a non-at-issue component of meaning, and rejects a semantic treatment of exhaustivity. In chapter 7 (*Information structure and presupposition*), Kjell Johan Sæbø examines the notion of presupposition in detail. *[I] did the dishes* presupposes that someone did the dishes. He points out three areas where the notion of presupposition interacts with IS and discusses each in detail: (i) presupposition triggered by focus operators under Rooth's alternative semantic theory of focus; (ii) presupposition as the background of focus; and (iii) relation to discourse structure, to which both IS and presupposition are sensitive. Presupposition is understood as the conditions that the CG must meet in order to be updated with the sentence. It is shown that a theory which does not directly involve an existential presupposition, but which creates the potential, in the form of the alternative set, for a general process to generate a defeasible presupposition is to be preferred over theories that create presuppositions as the complement of focus.

The following chapters discuss specific theories dealing with syntactic theories of information structure and the syntax–phonology interface. Chapter 8 by Enoch Aboh (*Information structure: A cartographic perspective*) surveys the cartographic line of syntactic approaches to information structure, as proposed by Rizzi (1997). This theory claims that information-structure-sensitive notions (e.g. topic, focus) are encoded by means of discourse markers that trigger various constituent displacement rules. He illustrates his approach with numerous examples, among others taken from Gbe languages of the Kwa family that have topic and focus markers, in bold face in the following example: *Náwè lɔ́* **yà** *gbákún étɔ̀n* **wɛ̀** *é ɖè* 'As for the woman, she took off HER HAT'. In chapter 9 (*Nuclear stress and information structure*), Maria Luisa Zubizarreta compares the predictions of the nuclear stress for Germanic and Romance languages, the latter kind of languages having a rigid rightmost stress pattern, as in *Compró el libro JUAN* 'Juan bought the book.' Moreover, she proposes that the unmarked pattern under wide-focus condition, originates in a different way from narrow focus. Chapter 10 by Karlos Arregi (*Focus projection theories*) is dedicated to a comparison between two theories ('Default Prosody' and 'F-projection' approaches) of how focus projection arises. In the

first model, it is a consequence of general and default rules of grammar, and in the second model, it needs to be implemented by means of rules. Arregi shows that the first model makes better predictions in general and illustrates with Basque data. Chapter 11 by Vieri Samek-Lodovici (*Constraint conflict and information structure*) provides an overview of conflict-based analyses, specifically Optimality Theory (OT), of information structure. It centres on focalization of Italian post-verbal constituents, as in *Parleranno tutti*. 'Everybody will speak.' *No. Non parlerà* [NESSUNO]_F. 'No. Nobody will speak.' And it shows that OT provides the tools for accounting for typological variations.

1.4.2   Part II: Current issues on information structure

Part II introduces case studies of various IS-related topics necessitating interface approaches. The direct reference to IS in grammar, as a result of its inclusion in a theory of grammar, has changed our views about what is possible and what is marked in linguistic structures, and it has shown that modules of grammar have to be more connected with each other than has been assumed until now. The need to bring multidisciplinary approaches to bear on critical questions is the motor for many fruitful collaborations across research specialties for issues addressing IS. However, we only start to understand why languages are so diverse in the way they implement IS.

In the first 10 chapters of this part (chapters 12–21), various semantics and morphosyntactic issues are discussed in relation to IS. In chapter 12 (*Focus-sensitive operators*), Sigrid Beck studies the role of focus sensitive operators as expressions that operate on alternatives. She agrees with Rooth (1992, chapter 2 of this volume), who proposes that it is the squiggle operator ~ that is the alternative evaluating operator, rather than quantifiers like *only, even*, and *always*, as in *Derk only saw a raven*. Moreover, and this is also reminiscent of Rooth's chapter, she examines further expressions that operate on alternatives like those involved in question formation and negative polarity item licensing. In chapter 13 (*Quantification and information structure*), Manfred Krifka surveys data and theoretical models that concern the interaction between IS and quantification. He first discusses a type of quantification expressed by adverbial quantifiers, generic sentences, or modal operators (A-quantification) and suggests that adverbial quantification (*always, usually*) is focus sensitive. In the second part of the chapter, quantification expressed by nominal quantifiers (*Every black die is loaded*) and determiners (D-quantification) are investigated and it is shown that these quantifiers, whose restrictors are usually fixed rigidly by syntax, can interact with IS to exhibit exceptional cases. He also discusses cases where some quantifiers are explicitly focused or topicalized, depending on their meaning. In chapter 14 (*Contrast: Dissecting an Elusive Information-structural Notion and its Role in Grammar*), Sophie Repp shows that the notion of contrast is a difficult one. In the sentence *Pete went to Rome, Marc went to London*, not only the alternatives that the contrastive constituents evoke, but also the discourse relations that connect the discourse segments containing the contrastive constituents, are subjected to detailed analysis for their effects on grammar (prosody,

morphosyntax). In chapter 15 (*Verum focus*), Horst Lohnstein examines Höhle's (1988, 1992) notion of verum focus 'emphasizing the expression of truth of a proposition', as in *Carl DID feed the dog*. After presenting several approaches to verum focus in the literature, Lohnstein examines the role of sentence mood and discourse situation in verum focus constructions. He claims that verum focus is focus on sentence mood, and that it is used to reduce the alternatives of (verbal) behaviour characterized by the functions of the sentence mood (e.g. stopping disputations about the issue that is verum-focused). In chapter 16 (*Predicate focus*), Malte Zimmermann studies focus on the verbal element and on functional elements in the extended verbal projection (*Peter kicked the cat. No, Peter PETTED_F the cat.*) The chapter contains a cross-linguistic overview of the grammatical strategies available for marking predicate focus. It investigates asymmetries in the realization of predicate as opposed to term focus by means of obligatory marking, grammatical strategy, and complexity. In chapter 17 (*Information structure and discourse particles*), Patrick Grosz studies the relationship between IS and German discourse particles, such as *ja* in examples like *weil man ja arbeitet/weil ja wer arbeitet*. 'because one/someone is working *as you know*'. These particles contribute to the CG management, and are not necessarily truth conditional, as one can see from the translation. The chapter evaluates the thesis that discourse particles separate clauses into rhematic and thematic information and that they are focus sensitive. Grosz also addresses 'relational' discourse particles (e.g. *doch* and *schon*) operating on a contextually salient alternative proposition. Chapter 18 (*Ellipsis and information structure*) by Susanne Winkler investigates the role of information structure in ellipsis. VP-Ellipsis is illustrated in the following sentence where the striked out part is elided: *Anna promised to play the piano but she DIDN'T* play the piano. According to Winkler, syntactic and information-structural theories interact in accounting for the licensing of the different types of elliptical phenomena. Moreover, information structure (especially givenness and focus) and discourse factors influence the form and the interpretation of ellipsis. In chapter 19 (*Word order and information structure*), Ad Neeleman and Hans van de Koot investigate the phenomenon of allegedly free word order in a typological perspective and show that IS is a powerful motor for word order changes. Using data from Dutch, they establish four generalizations (Given-before-new, A-relatedness, No derived topic–focus mismatch, and No focus resumption) that capture the relation between IS and word order. Chapter 20 (*Dislocations and information structure*) by Luis López examines dislocations, as illustrated by the following Spanish example: *Los cubiertos, ya los he puesto sobre la mesa.* 'I already put the silverware on the table.' He separates the dislocations in H-type (hanging topics, left dislocations, weakly connected to the main clause) and D-type (left and right dislocations, contrastive, strongly connected to the main clause) and shows that they have different information structural properties. In chapter 21 (*Discourse-configurationality*), Balázs Surányi examines the property shared by many languages that topic and focus are associated with particular phrase structure configurations. He shows that discourse-configurationality and (non-)configurationality are mutually independent properties, and illustrates their effect and variation in numerous languages. For example, the word order of non-configurational languages

may be governed by non-IS factors such as person/animacy (Fijian), evidentiality (Quechua), and so on.

The next three chapters are dedicated to phonological analyses at their interface with information structure. They investigate the theoretical approaches that have been developed to deal with metrical and prosodic prominence in European languages. In chapter 22 (*On the expression of focus in the metrical grid and in the prosodic hierarchy*), Sara Myrberg and Tomas Riad address the relation between prosodic hierarchy and metrical grid structure that can change as a result of information structure. They compare English, a lexical stress language, and Swedish, a pitch accent language, and investigate nested focus in both languages, as in the so-called Superman sentences of Neeleman and Szendrői (*Johnny was reading Superman to some kid*) and Second Occurrence Focus (SOF). In chapter 23 (*Focus, intonation and tonal height*), Hubert Truckenbrodt is interested in the tonal effect induced by focus (F-marking in his account) and givenness. He concentrates on German and Mandarin Chinese. Besides showing the effect of focus prominence, a principle positing that focus attracts the strongest stress in the sentence, his main point is to show that focus immediately changes the height of accents without changing first the reference lines of prosodic phrases. He uses dual focus in Chinese for illustrations. In chapter 24 (*Second occurrence focus*), Stefan Baumann reviews the effect of Second Occurrence Focus (SOF) on the intonational correlates of focus and givenness. In the sentence *A: Everyone knew that Mary only eats [VEGetable]$_{FOF}$. B: If even PAUL knew that Mary only eats [vegetables]$_{SOF}$, then he should have suggested a different restaurant*, the expression *vegetables* in the second sentence is SOF because it is a focus associated with a focus sensitive operator *only*, and it appears for the second time in the discourse. Baumann surveys the theoretical questions (semantic and phonological) this phenomenon raises, as well as various analyses in the literature.

In the last chapter of Part II (chapter 25 *Information structure and language change*), Regine Eckardt and Augustin Speyer examine the effect of IS on language change. They propose that the range of focus sensitive particles, the focus related syntactic patterns, and the alternative-based constructions can change with time, but that the invariant semantics of focus do not change. They illustrate their proposal with the contrast between V2 movement in Germanic languages, and its loss between Middle English and Early Modern English.

1.4.3 Part III: Experimental approaches to information structure

Part III is an overview of the state of the art in the study of information structure from different experimental perspectives. It introduces studies from various sub-disciplines of linguistics that shed a new light on this research. Experimental perspectives have been another motor for theoretical advances. The eye-opening effect of experimental method for the sake of investigating possible structures has highlighted the complexity of linguistic behaviour with respect to IS. In a methodological shift, processing and

cognition have entered the scene only recently, but these advances are progressively and radically changing the way we deal with theoretical issues.

In chapter 26 (*Information structure and language comprehension: Insights from psycholinguistics*), Elsi Kaiser examines how psycholinguistics has studied comprehension of IS correlates, especially on how prosodic and syntactic cues are processed in real time. She reviews several experimental methods to this effect: time-based measures, attention-based measures, and off-line methods. Chapter 27 (*Information structure and production planning*) by Michael Wagner is complementary to chapter 26, as it concentrates on the production of IS cues from a psycholinguistic perspective. He distinguishes two views on the effects of IS: production planning models see IS effects as a consequence of contextual salience affecting the speaker's lexical selection or grammatical functions assignment at the functional level, while linguistic models treat IS functions as part of grammatically encoded information which is processed incrementally in production. Chapter 28 (*Information structure in first language acquisition*) by Barbara Höhle, Frauke Berger, and Antje Sauermann, reviews the literature on the acquisition of linguistic means related to IS, especially production and the comprehension of accentuation, word order, and the effect of focus particles. In chapter 29 (*Towards a neurobiology of information structure*), Ina Bornkessel-Schlesewsky and Petra Schumacher investigate the neurophysiological and neuroanatomical correlates of IS notions and relate them to higher-order cognitive processing, like prediction and mental modelling, attention orientation, memory, and inferencing. The last chapter in Part III, chapter 30 (*Corpus linguistics and information structure research*) by Anke Lüdeling, Julia Ritz, Manfred Stede, and Amir Zeldes passes review of existing linguistic corpora for the study of IS. The authors show that there are two sensitive aspects for corpora: the design of a corpus that can serve as a basis for qualitative or quantitative studies and the problem of annotation.

1.4.4 Part IV: Language studies on information structure

Part IV groups chapters on different languages or language families. Each of the chapters examines how the different IS roles are reflected in the grammar of the particular languages (or language families). Most chapters compare the role of syntax, prosody, and morphology for the expression of topic, givenness, and focus, but they also address specific cases of IS when they use surprising or non-standard ways of expression. This part can be understood as test cases for the preceding chapters. It reveals the diversity of the means used by different languages.

In chapter 31 (*Syntactic and prosodic reflexes of information structure in Germanic*) Gisbert Fanselow shows that despite evident differences among Germanic languages, common tendencies can be identified, like the preference for prosodic prominence in the final part of the sentence, and the fact that focus can be realized *in situ*, in which case it is realized with the highest prominence in its domain. However, some Germanic languages change word order as a function of IS more easily than others. In chapter 32 (*Syntactic and prosodic effects of information structure in Romance*) Giuliano Bocci

and Cecilia Poletto review Romance languages in a cartographic approach. Different syntactic positions can have different IS roles. Dislocations are also investigated, as they are typical for Romance languages. Specific tonal analyses are proposed for Italian, which have been shown to realize information structural roles of constituents. Chapter 33 (*Discourse functions: The case of Hungarian*) by Katalin É.Kiss discusses the IS in the Hungarian sentence from a syntactic, semantic, and pragmatic perspective. She envisages the topic as the logical subject of the sentence, binding an empty argument in the main clause. Focus also gets a syntactic analysis, as it is necessarily derived by movement to a special syntactic position. Furthermore, it expresses exhaustive identification. In chapter 34 (*Information structure in Modern Greek*), Stavros Skopeteas reviews three properties of Greek IS: variable word order, free focal accent placement, and clitic doubling of DP arguments. It is shown that Greek is both similar and different from Germanic languages. Both left- and right-dislocations play a major role in the expression of IS in Greek. In chapter 35 (*Information structure in Slavic*) Katja Jasinskaja reviews the grammatical reflexes of IS in Slavic languages. She shows the effect of intonation and syntax for different IS roles. She shows the role of different tonal patterns in Russian, and also reflects on the role of full forms, clitics, and zeroes for the expression of givenness. Particles are treated in a separate section. She emphasizes that, even if Russian is better studied than the other Slavic languages, differences among languages abound and need more study. In chapter 36 (*Topic and focus marking in Chinese*), Yiya Chen, Peppina Po-lun Lee, and Haihua Pan show that, even though syntax and prosody compete for the expression of IS, they are usually complementary rather than mutually exclusive in Mandarin Chinese. Prosodic effects are pervasive. There are numerous syntactic and morphological means to identify a focus. The notion of topic is traditionally associated with the notion of subject, and Mandarin is a topic-prominent language. Chapter 37 (*Information structure in Japanese*) by Satoshi Tomioka, is dedicated to the expression of IS in Japanese. It is shown that Japanese is both similar and different from English in several subtle ways: prosody and syntax are used in similar ways in both languages. However, the use of cleft sentences and of markers like *wa* is typical for Japanese, and express different kinds of IS roles. Tomioka also illustrates recursivity of information structure with Japanese examples. Chapter 38 (*Information structure in Asia: Yongning Na (Sino-Tibetan) and Vietnamese (Austroasiatic)*) by Alexis Michaud and Marc Brunelle, describes two understudied Asian languages, Na and Vietnamese, and emphasizes the diversity of means used for the expression of IS in these languages, which they describe as typical for the diversity among languages in general. Beside emphatic stress and word order changes, Na has a wealth of discourse particles used for the expression of topic and focus. Moreover, it also uses intonational and phrasing means for expressing givenness. Vietnamese, by contrast, has much fewer IS particles, but it extensively uses intonational means. For givenness, ellipsis is a common strategy. In chapter 39 (*Information structure in Bantu*) Laura Downing and Larry M. Hyman emphasize the diversity that Bantu languages present in their grammatical means for expressing focus. They are particularly interested in the prosodic, syntactic, and morphological reflexes, and suggest that information structure does not need special

syntactic positions or special markers in prosody and morphology. This suggestion is illustrated among others with disjoint and conjoint verb allomorphs (Meeussen 1959), but also with word order and dislocations, all operations that are not exclusively used for IS. Other similar examples are nominal cases expressed by tones, as well as metatony, which typically have different functions, one of them being IS.

The final chapter of the volume, by Vadim Kimmelman and Roland Pfau, chapter 40 (*Information structure in sign languages*) describes how IS is expressed in Sign Languages, that is, in languages using the visual-gestural modality of signal transmission, as opposed to the oral-auditory modality of spoken languages. The authors show that there are striking similarities in how these languages transmit IS. For instance, all languages use prosodic and syntactic means, and none of them uses morphological means. Non-manual marking (like raised brows) is commonly used.

Acknowledgements

PART I

THEORIES OF INFORMATION STRUCTURE

CHAPTER 2

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ALTERNATIVE SEMANTICS

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MATS ROOTH

2.1 INTRODUCTION

ALTERNATIVE *semantics* is a semantic framework that finds application in the analysis of questions, focus, disjunction, negative polarity, presupposition triggering, and implicature. The unifying idea is one of semantic, pragmatic, or discourse-structural operations or constraints referring to 'alternative' phrasal meanings. This chapter presents the analysis in alternative semantics of prosodic focus. Some of the other applications are sketched in the last section.

In English, German, Japanese, Korean, and many other languages, there are constructions, discourse configurations, and pragmatic interpretations that show a phonology and phonetics of prominence, and where a common semantic-pragmatic element related to alternatives and/or redundancy can be identified. We begin with examples of these.[1]

Scalar some. The existential determiner *some* is frequently used with a limiting implication. In example (1a), the speaker suggests that only some people can be easily eliminated. Sentence (1b) functions as a correction or hedge, admitting that the group that are supporting Mr Valentine do not necessarily include the public or all the public. In these utterances, which were made on sports talk shows, the word *some* is noticeably prominent. In sentence (1c) the word *some* was destressed, and here a limiting implication along the lines of 'some but not many' would not fit in, because it would undercut the positive message.[2]

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[1] Audio recordings are included in Rooth (2015).
[2] These examples are drawn from the study in Chereches (2014) of the pragmatics and acoustics of about two hundred tokens of *some* from sports talk shows.

(1) a. It's fairly easy to kind of eliminate SOME people like Terry Francona's wife.

    b. The public right now may be sitting there supporting Bobby Valentine or SOME people are supporting him against Dustin Pedroia.

    c. You know if you're looking for him to inspire some people in this in this Yankee-Tiger series listen to this.

Questions and answers. When questions are paired with clausal answers, constituents in the answer that correspond to the WH position in the question are prominent. Thus in (2), the vertical pairings are well-formed question–answer pairs, and the diagonal ones are ill-formed.

(2) Qa: Who cut Bill down to size?   Qb: Who did Mary cut down to size?

    Aa: MARY cut Bill down to size.   Ab: Mary cut BILL down to size.

The correlation, which was discussed as early as Paul (1880), is called *question–answer congruence*. Descriptively, answer A is congruent to a question Q if and only if substituting wh-phrases for the focused phrase (or phrases) in A and then performing morpho-syntactic adjustments such as wh-movement and do-support can result in Q.

Comparatives. The four utterances in (3) embed the comparative clause *than I did.* The first two were spoken with prominence on the subject pronoun *I*, and the second two were spoken with the subject pronoun destressed. Utterances of this form are covered by a simple descriptive generalization: the subject pronoun is prominent if reference has shifted from the subject position of the main clause to the subject position of the *than* clause, and is destressed when reference is constant (Howell 2011).[3]

(3) a. The aquarium got more attention than I did.

    b. Tom actually said it a lot better than I did.

    c. I should have liked that song a lot more than I did.

    d. I understand that a lot more now than I did a few years ago.

Korean indeterminates. Korean indeterminate morphemes such as *nugu* ('who', 'someone') are ambiguous between wh- and existential readings. The wh-reading is reported to have prosodic characteristics of focus, with pitch boosted on the

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[3] Howell looked at several hundred examples of this form from online sources. Listeners who were asked to naively classify prominence listening just to the three words *than I did* behaved in a way that is consistent with the reference criterion about 90 per cent of the time. Machine learning classifiers trained to make the reference-shift decision based on acoustic features in *than I did*, such as duration, formant spread, and pitch are able to make the reference-shift decision with about 90 per cent accuracy from the acoustic features.

indeterminate morpheme, and reduced pitch following. Sentence (4), which is quoted from Yun (2013), is ambiguous between the three readings in (5). Boosting of prosody on the indeterminate followed by reduced prosody for the rest of the sentence favours a wh-question reading.[4]

(4) *nay-ka   nwukwu-hako kyelhonha-myen ton-ul   pat-a*

     I-NOM   who-with   marry-if   money-ACC get-INT

     (Lit. 'I will get money if I marry [who/someone].')

(5) a. I will get money if I marry someone. (Any guy would be okay. Narrow scope existential.)
    b. I will get money if I marry someone. (Though not if I marry someone else. Wide scope existential.)
    c. Who is the person such that I will get money if I marry that person? (wh-question.)

Substitution instances for quantifiers. This scenario comes up frequently in sports talk shows. In a discussion of a specific player, a generalization is stated that is understood to imply an application to the player as a substitution instance. When the phrase *any player* is used as the quantifier in this discourse configuration, the determiner *any* is markedly prominent. See the utterances transcribed in (6).

(6) a. Well uh I think that uh all the conversations between myself and ANY player uh that are private will remain between myself and the player. I think that's the way we normally handle it, that's how we'll handle it in this case.
    b. You know being Lebron with constant questions about his legacy and this kind of assumption that he's gonna you know he needs to start winning titles pronto or he's a fraud that would be tough for ANY player.

Lists. List-structured phrases show quasi-predictable prominence patterns. Example (7) is a transcript of a listing of some radio station call signs and their home towns, as spoken by Scott Hollis, a DJ. The call signs were spoken as sequences of four-letter names, and are transcribed using capitals to mark prominence. Prominence falls on the letters where the current call sign differs from the previous one.[5]

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[4] In a perception experiment, Yun presented listeners with tokens of such sentences with manipulated pitch contours, and asked them to evaluate fit with parapraph contexts that favoured one reading or the other. The wh-reading correlated with the focus-like prosody of boosting and subsequent reduction.

[5] This is obvious in [wsQg], where the prominence is non-final. Probably [wskg fm] is a unit with default prominence to the right, so that even in the first call sign, prominence has shifted to the left. In some cases the town names also sound like they have extra prominence.

(7)   This is wsk<small>G</small> fm hd Binghamton, wsq<small>G</small> fm hd Ithaca, wsq<small>E</small> fm hd Corning, wsq<small>A</small> fm hd Hornell, wsq<small>C</small> fm Oneonta.

Contrasting antecedents. In (8), the prominence on the subject in the second sentence can be seen as motivated by contrast with the first sentence.[6]

(8)   Newton discovered calculus. No, Leibniz discovered it.

Farmer sentences. Farmer sentences are sentences with sentence-internal contrasting antecedents, where the contrast is at the nominal level rather than a clausal one, and which can show a dual, symmetric expression of focus. In (9) the first word in *Canadian farmer* is more prominent than the second word, even though the phrase has default prominence on the right. Optionally, prominence can be shifted in *American farmer* as well.

(9)   An American farmer told a Canadian farmer a joke.

Accommodated contrasts. In many cases, a prominence shift seems to be motivated by a contrast with something that is not overt in the discourse. Example (10) is a statement by DJ Hollis at the end of a weekly programme. The word *next* was prominent. The statement does not require an overt antecedent along the lines of the statement that the DJ is here this week with three hours of great jazz. But the speaker intends for his listeners to accommodate this contrasting antecedent.

(10)   That wraps up Jazz in Sillouette, but remember I'll be back again next week with three more hours of great jazz.

Association with only. John introduced Bill and Tom to Sue, and there were no other introductions. In these circumstances, sentence (11a) is false, while (11b) is true. Contexts like this one where focus has an influence on truth value (or other aspects of compositional semantics, such as semantic presupposition) are known as *association with focus* contexts.[7]

(11)   a. John only introduced Bill to Sue.
       b. John only introduced Bill to Sue.

Reasons. Dretske (1972) pointed out that focus has a truth-conditional effect in counterfactuals, descriptions of reasons, and further contexts that seem to involve underlying counterfactual reasoning. Assuming the situation in (12), in the sentences of (13) we

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[6]   See Repp (this volume) on phenomena and analysis of this kind of use of focus.
[7]   See Beck (this volume) on the analysis of association with focus effects for *only* and similar operators.

observe variation in truth value that is conditioned by the location of focus, just as in the sentences with *only*. Dretske emphasized that such examples show that one has to pay attention to focus in compositional semantics, not just at the discourse and pragmatic levels.[8]

(12) Pat had two daughters, one named Bertha; the other was named Aretha and was indispensable to him in his business. He had made a commitment to marry one of his daughters to one of the sons of a man who once saved his life. There were two such sons, the elder son Clyde and the younger son Derek. According to the custom of the society and period, an elder son had to marry before his younger brothers; this was known as seniority. Given the commitment, seniority, and the desirability of leaving Aretha free to run the business for him, he figured out that the best thing to do was to marry Bertha to Clyde, and that is what he did.

(13) a. The reason he married Bertha to Clyde was that Aretha was indispensable in the buisiness.   *true*
      b. The reason he married Bertha to Clyde was that Aretha was indispensable in the buisiness.   *false*
      c. The reason he married Bertha to Clyde was that he wanted to obey seniority.   *false*
      c. The reason he married Bertha to Clyde was that he wanted to obey seniority.   *true*

Multiple focus. Most of the types of examples discussed above work also with two or more focused phrases, rather than just one. In (14) we see two focused phrases, with a preceding contrasting antecedent sentence. Example (15) has two focused phrases in an answer to a question with two wh-phrases. Our definition of question–answer congruence already allowed for multiple Fs.

(14) a. Leibniz invented calculus.
      b. Yea, and Gould$_F$ invented the laser$_F$.

(15) a. Who married whom?
      b. Bertha$_F$ married Clyde$_F$.

This concludes the catalogue of examples. All of them, at least under many accounts, are instances of the same phenomenon of 'focus'. This is essentially a grammatically-mediated correlation between a phonology-phonetics of prominence, and semantic-pragmatic factors that are hypothesized to be common to the constructions and discourse configurations.

[8] (12)–(13) are a version of an example of Dretske's, and are given in this modified form in Rooth (1999).

We turn now to a scheme for annotating three parameters of variation in focus: the *phrasal location* of a focus, the *scope* of focus, and *antecedents* for focus. Jackendoff (1972) introduced the strategy and grammatical hypothesis of localizing focus on surface syntactic phrases, using a focus feature ±F. Usually only the positive value is indicated, using a subscript. When a phrase is F-marked, there is a prominence realizing the focus in the phonological realization of the phrase.[9]

The dialogues (16)–(17) motivate the notion of scope. Questions are numbered using subscripts, and various phrases that do or do not satisfy question–answer congruence relative to the question are marked with a brace. Congruence is annotated as ~k for the phrase being congruent to question k, and ⊀ k for the phrase not being congruent to question k. The pair (16a,b) is the standard case of question–answer congruence. Statement (16c) is another response to the question (16a), also with focus on *Justin*. Although (16c) is not really an answer to (16a), we can assume that the focus is motivated by congruence to the question. While the entire sentence does not satisfy congruence (pair (16a,d)), the embedded sentential subject does satisfy congruence with respect to the question (pair (16a,c)). In (17), the question is changed, with a resulting switch in the phrases that satisfy congruence. This time the entire sentence does satisfy congruence with respect to the question (pair (17a,c)), and the embedded sentential subject does not (pair (17a,b)).

(16) a. [who is going to the party]$_1$

    b. [$\underbrace{\text{Justin}_\text{F} \text{ is going}}_{\sim 1}$]

    c. [for [$\underbrace{\text{Justin}_\text{F} \text{ to go}}_{\sim 1}$]] would surprise me.

    d. [$\underbrace{\text{for Justin}_\text{F} \text{ to go would surprise me}}_{\curlywedge 1}$]

(17) a. [whose going would surprise you]$_2$

    b. [for [$\underbrace{\text{Justin}_\text{F} \text{ to go}}_{\curlywedge 2}$]] would surprise me.

    c. [$\underbrace{\text{for Justin}_\text{F} \text{ to go would surprise me}}_{\sim 2}$]

In this way congruence provides motivation for the hypothesis that the scope of the focus in the dialogue (16a,c) is the embedded sentential subject, and in the dialogue (17a,c), the entire response. Remarkably, the scopes that result from considering congruence agree with a *prosodic* notion of scope. In the dialogue (16a,c), the embedded subject *Justin* is prominent, but it does not outrank the following predicate *surprise me*

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[9] Thus the F feature and its scope marker are interpreted phonologically as well as semantically. The phonological interpretation in terms of prominence in a metrical grid that is presented in Myrberg and Riad (this volume) is compatible with the representational scheme introduced here.

in prominence—the latter bears the nuclear accent of the sentence. On the other hand, in dialogue (17a,c), *Justin* does bear the nuclear accent. We can hypothesize that in the first dialogue, the phonological domain of prominence for the embedded subject *Justin* is the embedded clause, while in the second dialogue, the domain of prominence for *Justin* is the matrix clause. If so, phonological domains of prominence agree with the scopes that result from the assumption that congruence with respect to the question is to be satisfied. This phonological-semantic isomorphy is the strongest argument for the locus/scope/antecedent grammar of focus.

At this point we have arrived at the notation from Rooth (1992). The scope of F is marked with an operator ~k in surface trees, where k is the index of an antecedent with respect to which congruence is satisfied. The indices have the status of semantic indices, that is, indices which correspond to variables in semantics, and/or to discourse referents in a discourse representation. While in many cases antecedents correspond to an overt phrase, they can also be accommodated, as in the *next$_F$ week* example.

The significance of the scope of focus was realized relatively late. In Jackendoff (1972), it seems to be assumed that the semantic scope of focus in our sense is always the matrix sentence. In agreement with this, in the phonology, F-marked phrases take the matrix sentence as their phonological domain, because they bear a special stress feature that is not demoted in the application of cyclic stress rules in the system of Chomsky and Halle (1968). Rooth (1992) discussed non-maximal scope in farmer sentences, using the representation in (18). The isomorphy argument was developed in Truckenbrodt (1995), referring to farmer sentences.[10] His point about (18) is that while *Canadian* is maximally prominent in its host nominal, it is not the location for the nuclear accent, which falls on *joke*.

(18) [an American$_F$ farmer]$_2$~3 told [a Canadian$_F$ farmer]$_3$~2 a joke.

Notice that in (18), the notion of congruence has been generalized. The antecedent [an American farmer] is hypothesized to be congruent to the host phrase [a Canadian$_F$ farmer], but it is not assumed (or is not necessarily assumed) that the antecedent contributes a question, either directly or indirectly.

A couple of notes are in order about the status of the notation and examples introduced above. The syntactic locus/scope/antecedent notation embodies a grammatical hypothesis, the adequacy of which is not taken for granted. The hypothesis has to be spelled out, notably by articulating the semantic/pragmatic and phonological interpretation for the syntax, and it has to tested against evidence and compared to competitors.

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[10] The analysis of focus in Chomsky (1971) referred to representations where the scope of focus is represented by what amounts to movement and bound variables, corresponding to LF movement in subsequent theory. This creates the potential for sub-maximal scope, because movement can be to a sub-maximal level, such as an embedded clause. But sub-maximal scope was not discussed. Jacobs (1983), von Stechow (1991), and Rooth (1985) gave semantically oriented accounts that generate sub-maximal focus scopes, while hardly talking about examples with embedded scope.

The examples, in addition to orienting the reader, are intended as an ostensive definition of focus, or of a certain kind of focus. In this it is not assumed prior to analysis that these examples have the same underlying nature. If they do not, then they do not belong in the same theoretical box, and we should countenance several different theoretical notions of focus, or apply different terminology. Sections 2 and 4 of this chapter review analyses which do succeed in identifying a shared deep commonality in the constructions and configurations listed above.

By the way, not every construction in every language that shows question–answer congruence is necessarily an instance of the kind of focus under discussion here. The arguments reviewed in É. Kiss (2010 and this volume) indicate that the structural or movement focus found in Hungarian has a distinct semantics from English-type prosodic focus, and a distinct distribution. Yet movement focus is used in default answers in Hungarian, and shows question–answer congruence. In general, we should resist giving any kind of substantive definition of focus prior to analysis, referring either to question–answer congruence, the evocation of alternatives, or a broadly information-theoretic notion of the focus being unpredictable relative to the rest of the material in the scope of the focus. The fundamental problem with starting in this way is that it prejudges the issue of what the optimal theoretical account is. Interesting terms in scientific theories do not have non-ostensive definitions that are independent of theories.

2.2 SEMANTIC INTERPRETATION

Consider (19), where the clause $[\phi \sim k]$ embeds a focused phrase and is indexed to a preceding contrasting clause. We assume a system of interpretation where clauses semantically contribute propositions, for example as constructed in possible worlds semantics. Suppose **discover** is a two-place function from individuals to propositions. Then the antecedent in (19) denotes the proposition **discover(n,c)**, and the host clause for the focus denotes the proposition **discover(l,c)**. Informally, the antecedent proposition is an alternative to the host proposition that can be obtained by making a 'substitution' in the position of the focused phrase. This is the core idea of alternative semantics: a legitimate antecedent for focus denotes an alternative to the scope of the focus, or as we will see in a moment, a set of alternatives.

(19) [Newton discovered calculus]$_2$

No, [Leibniz$_F$ discovered calculus] ~2

$$\phi$$

The notion of making substitutions in the focus positions of propositions need not be taken literally. For one thing, propositions as constructed in possible words semantics

do not have positions—they are unstructured sets of worlds. For another, some way of tracking the focus positions from the syntax to the semantics is needed. For now, we will just assume that the semantics of the language makes available, in addition to an ordinary semantic value (which is a proposition in the case of a clause), a set of eligible alternatives, which for a clause is a set of propositions. The set of alternatives is a 'focus semantic value', or 'alternative semantic value'. The focus semantic value for ϕ in (19) can be expressed formally as in (20), using set abstraction.[11] It is the set of propositions that can be obtained by plugging in some individual for y in the open proposition-naming term $\textbf{discover}(y,\textbf{c})$. Hamblin (1973) introduced a useful informal way of naming such alternative sets. We say that the alternative set is the set of propositions of the form 'y discovered calculus'.

(20) $[\![\text{Leibniz}_\text{F} \text{ discovered calculus}]\!]^\text{o} = \textbf{discover}(\textbf{l}, \textbf{c})$

$[\![\text{Leibniz}_\text{F} \text{ discovered calculus}]\!]^\text{f} = \left\{ p \mid \exists y. y \in D_e \land p = \textbf{discover}(y, \textbf{c}) \right\}$

$= \left\{ \textbf{discover}(y, \textbf{c}) \mid y \in D_e \right\}$

Now we are ready to formalize this simple idea: a phrase of the form $\phi \sim k$ is associated with the constraint that the antecedent k is an alternative to the semantic object contributed by ϕ. The set of eligible alternatives is $[\![\phi]\!]^\text{f}$, so we require that the semantic element k be an element of the alternative set. Rule (21) says in addition that k should be different from the ordinary semantic value $[\![\phi]\!]^\text{o}$.

(21) Alternative licensing (first version) $\phi \sim k$ requires that the semantic element k is an element of $[\![\phi]\!]^\text{f}$ that is distinct from $[\![\phi]\!]^\text{o}$.

The terminology 'the semantic element k' is explained in the same way as with other varieties of indexing, such as indices on traces and pronouns. In a standard formulation of a static semantics, values for variables are given by assignment functions, so the semantic object is $g(k)$, where g is the assignment function. It is natural to think of the index k as a discourse referent in a discourse representation, which may be projected from a syntactic index, but may also be constructed. The framework should make available discourse referents of all types, including propositions. So the picture is that (19a) sets up a propositional discourse referent 2, which is used as an antecedent in checking the focus constraint for the second sentence. So while $\phi \sim k$ is a piece of syntax, the focus constraint is checked semantically.

The licensing condition (21) covers cases where the antecedent has the same type as the host phrase for the focus. When the host phrase is a clause and has the propositional type, the contrasting object is a proposition. When the host phrase denotes a generalized quantifier as in the farmer sentence (9), the antecedent is also a generalized quantifier. This does not work when the antecedent is a question and the host phrase is a declarative answer,

[11] The 'destructuring' set abstraction notation {$\textbf{discover}(y,\textbf{c}) \mid y \epsilon D_e$} is potentially ambiguous, because one has to know whether y is allowed to vary, or is held constant. In this chapter, all free variables before the bar are allowed to vary over the combinations of values that satisfy the constraint after the bar.

because questions and statements have different semantic types. This brings up the connection between alternative semantics for focus and the alternative semantics for questions that was proposed in Hamblin (1973). Hamblin's semantics can be viewed as being motivated by the principle that any viable semantics for questions must be capable of characterizing what counts as an answer. One way of meeting this constraint is to take the semantics of a question to be a set of propositions, the set of atomic answers to the question, independent of the truth of the answers. So the semantic value of the question (22a) is the set of propositions of the form 'y invented calculus', where y is a person. This is nearly the same as the focus semantic value of the answer (22b). This suggests generalizing the congruence condition, so that the antecedent can be a *set* of alternatives, rather than a single alternative. Rule (23) is a way of stating this. The idea is that since the alternative propositions in the semantics of the question are restricted to people, while the alternatives in the focus semantic value are unrestricted, the antecedent is a proper subset of the focus semantic value. Rooth (1992) also included the condition that the ordinary semantic value of the scope of the focus is an element of the antecedent, and that the antecedent has cardinality of at least two. These conditions, which in a way correspond to the distinctness condition in part (i) of (23), are included in part (ii).

(22) a. [who invented calculus$_2$]$_3$
      b. [Leibniz$_F$ invented it$_2$]~3

(23) Alternative licensing (second version)
      $\phi \sim k$ requires that the semantic element k is either

      (i)   an element of $[\![\phi]\!]^f$ that is distinct from $[\![\phi]\!]^\circ$, or
      (ii) a subset of $[\![\phi]\!]^f$ of cardinality at least two that includes $[\![\phi]\!]^\circ$.

A different way of going is to set up the semantics so that the focus semantic value itself gets restricted. Suppose that in generating alternatives for (22b), only people are substituted for Leibniz, so that we get the set of alternatives of the form 'y invented calculus', where y is a person. Then the focus semantic value of the answer would match the semantics of the question exactly.

2.3 COMPOSING ALTERNATIVES

The interpretation principle for the focus scope configuration $[\phi \sim k]$ refers to the alternative set $[\![\phi]\!]^f$ for the phrase ϕ. This section looks at how the alternative set is derived. Hamblin (1973) and Rooth (1985) suggested a recursive strategy: there are alternatives 'all the way down', and the alternatives propagate up the tree. Figure 2.1 shows a binary-branching tree for sentence (24). This is a multiple-focus example, where alternatives are generated from the focused subject *Aretha$_F$*, and the focused object *Clyde$_F$*. In the tree, each node is annotated with its ordinary semantics, and below that, an alternative set. To control the size of the sets, we assume that there
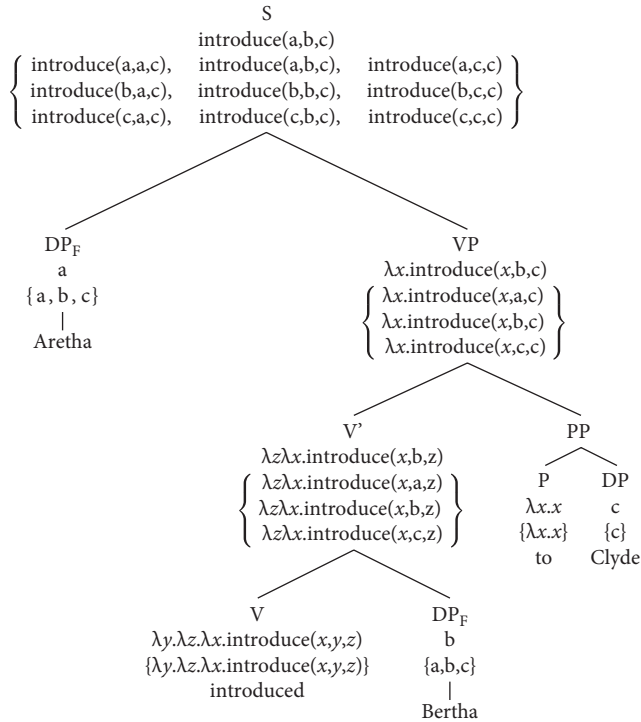
FIGURE 2.1 Recursively computed alternatives in a syntactic tree. Each node is annotated with its ordinary semantics, and below that a focus alternative set. The domain of individuals is $\{a, b, c\}$.

are just three entities in the model, namely entity **a** (Aretha), entity **b** (Bertha), and entity **c** (Clyde). At the top, we see the ordinary semantics **introduce(a,b,c)**, and an alternative set that contains alternatives such as **introduce(c,b,a)**. There are nine alternatives, resulting from multiplying a choice among three in the subject position by a choice among three in the object position. This is the set of propositions of the form 'y_1 introduced y_2 to Clyde' in this simple model. Looking at the bottom of the tree, the alternative set for the focused subject is $\{a,b,c\}$, the set of individuals in the model. The same goes for the focused object. This is how alternatives are 'launched': the alternative set for a focused phrase (whether it is a terminal or not) is the set of semantic objects that match the ordinary semantic value of the phrase in type. Non-focused terminals give a trivial alternative set, namely the unit set (singleton set) of the ordinary semantic value of the phrase. Since ⟦Clyde⟧ is **c** and the phrase is not focused, its focus semantic value is the unit set $\{c\}$.

(24) a. Who introduced whom to Clyde?
     b. Aretha$_F$ introduced Bertha$_F$ to Clyde.

If a complex phrase is focused, it goes by the rule already given—its alternative set is the set of semantic objects matching the ordinary semantics of the phrase in type. So for

instance, the alternative set for a focused VP is the set of all properties. Alternative sets for non-focused complex phrases are derived from the alternative sets for their children. Suppose we have a complex phrase with children α and β. Say α is semantically the function, so that the ordinary semantics is formed as $[\![\alpha]\!]([\![\beta]\!])$. If we pick any element f of $[\![\alpha]\!]^f$, and any element y of $[\![\beta]\!]^f$, they can also be combined as function and argument. The alternative set for $[\alpha\beta]$ is the set of all semantic objects $f(y)$ that can be formed in this way. Example (25) illustrates this for the phrase [introduce Bertha$_F$], where the verb is the function. There is one choice for f in $[\![\text{introduce}]\!]^f$, and there are three choices for y in $[\![\text{Bertha}_F]\!]^f$. From these three semantic objects can be formed as $f(a)$, as shown in (25).

(25) introduced $\qquad\quad \{\lambda y.\lambda z.\lambda x.\textbf{introduce}(x, y, z)\}$

Bertha$_F$ $\qquad\qquad\quad \{\textbf{a}, \textbf{b}, \textbf{c}\}$

introduced Bertha$_F$ $\left\{\begin{array}{l}\lambda z\lambda x.\textbf{introduce}(x, \textbf{a}, z) \\ \lambda z\lambda x.\textbf{introduce}(x, \textbf{b}, z), \\ \lambda z\lambda x.\textbf{introduce}(x, \textbf{c}, z)\end{array}\right\}$

Generalizing a bit, let F be the semantic rule that is used to combine $[\![\alpha]\!]$ with $[\![\beta]\!]$ in the phrase $[\alpha\beta]$. Then $[\![\alpha\beta]\!]^f$ is defined to be the set of all semantic objects that can be formed as $F(x,y)$, where x is an element of $[\![\alpha]\!]^f$ and y is an element of $[\![\beta]\!]^{f.12}$ In this case $[\![\text{introduce Bertha}_F]\!]^f$ is obtained as the image of the rightward function-application operator f_{RFA} acting on $[\![\text{introduced}]\!]^f \times [\![\text{Bertha}_F]\!]^f$.

Another way of defining alternatives is to introduce variables in the F positions that have the same type as the ordinary semantic value (Kratzer 1991; Wold 1996). For this purpose a separate family of variables is used. Focus semantic values have the same type as ordinary semantic values, and have variables in the focus positions. The table in (26) illustrates this for the example in Figure 2.1, using the u variables with subscripts for the special focus variables. In this system, there are no alternatives at recursive levels. Instead, alternatives are introduced in defining the ~ operator, by making substitutions for the special focus variables.

(26) | *phrase* | *focus semantic value* |
|---|---|
| introduced | $\lambda y.\lambda z.\lambda x.\textbf{introduce}(x, y, z)$ |
| Bertha$_F$ | $u_{e,1}$ |
| introduced Bertha$_F$ | $\lambda z.\lambda x.\textbf{introduce}(\text{x}, u_{e,1}, \text{z})$ |
| Clyde | $\textbf{c}$ |
| introduced Bertha$_F$ to Clyde | $\lambda x.\textbf{introduce}(\text{x}, u_{e,1}, \textbf{c})$ |
| Aretha$_F$ | $u_{e,2}$ |
| Aretha$_F$ introduced Bertha$_F$ to Clyde | $\textbf{introduce}(u_{e,2}, u_{e,1}, \textbf{c})$ |

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[12] Mathematically, this is an image construction (Hamblin 1973: fn. 8). In general the image of a function h on a subset Z of its domain is the set of values $h(z)$ that can be obtained by applying h to an element z of Z. In (25), $[\![[\alpha\beta]]\!]^f$ is the image of the rightward function application operator on the cross product $[\![\alpha]\!]^f \times [\![\beta]\!]^f$.

Either of these approaches provides a workable solution to the problem of defining focus alternative sets, in the service of making available the semantic objects that are used in the definition of the ~ operator.

Hamblin applied alternative semantics to questions. This works in the same way as alternative semantics for focus in the recursive part. There is an issue though about how to treat the restrictive property of the wh-phrase, which interacts in a subtle way with question–answer congruence. Consider the examples in (27), where the wh-pronoun has a lexical restriction to persons, the wh-phrase *what dog* has a restriction to dogs, and the wh-phrase *what Thai restaurants* has a restriction to Thai restaurants. One option is to equate the alternative set for the wh-phrase with the extension of the restriction, so that $[\![who]\!]^f$ is the set of people.

(27) a. Who is awake?
    b. What dog walks with Mary? [Hamblin]
    c. What Thai restaurants are in the neighborhood?

In this passage, Hamblin describes this 'restricting' option, argues against it, and proposes an alternative 'conjunctive' option.

> We would like to think that the phrase *what dog* could be treated as an interrogative proper name denoting the set of dogs, and that *what dog walks with Mary* has as answers just the set [of propositions of the form] '*x* walks with Mary' where *x* is the name of a dog. But the composition of the set of dogs does not necessarily remain constant from universe to universe: in some universes Rover may be a horse, and Mary herself a dog. I have taken the attitude that when someone answers *what dog walks with Mary* with *Rover* he states not merely that Rover walks with Mary but also implicitly that Rover is a dog, and hence that he states the conjunction. [Hamblin 1973: 51, with adjustments in quotation styles.]

The proposal then is that the alternative set for (27a) is the set of propositions of the form '*x* is a person and *x* is awake', and that the alternative set for (27b) is the set of propositions of the form '*x* is a dog and *x* walks with Mary'. This can be formulated by defining the alternative sets for *who* and *what* at the generalized quantifier level as in (28).

(28) $[\![who]\!]^f = \{\lambda Q.\lambda w.\mathbf{human}(w,x) \wedge Q(x)(w) \mid x \in D_e\}$
    $[\![[_D what]]\!]^f = \{\lambda P.\lambda Q.\lambda w.P(x)(w) \wedge Q(x)(w) \mid x \in D_e\}$

The conjunctive interpretation is not compatible with the theory of question–answer congruence from Section 2. The representation (29) is licensed if the alternative value for the question is a subset of the alternative value for the answer. In any realistic model, it is not, because for instance 'Justin is human and walks with Mary' is an element of the alternative value for the question, but not an element of $[\![Justin_F \text{ walks with Mary}]\!]^f$, which is the set of propositions of the form '*x* walks with Mary'.

(29) [who walks with Mary]$_1$ [Justin$_F$ walks with Mary]~1

Treatments of question–answer congruence in alternative semantics have assumed the restrictive strategy in the semantics of questions (Rooth 1992). But what about Hamblin's point that there is no stable set of propositions of the form 'x walks with Mary', where x is a human, because the sets of humans are different in different possible worlds? Relatedly, there is a worry that the focus constraint is trivialized in certain cases. In a world where there are no nuclear engineers, the denotation of the question (30a) is the empty set. Therefore the subset constraint coming from the focus interpretation in (30b) is trivial. This is not quite a problem, because the oddity of the pair (30a,b) can be attributed to the logic and pragmatics of the question–answer relation, rather than anything about focus. In any viable account of the question–answer relation, the proposition contributed by (30b) is not an answer to the question (30a). So to rule out this question–answer dialogue, it is not necessary to appeal to the focus presupposition. But if we fix this by adjusting the response as in (30c) (perhaps the cat being on the mat would prevent any dancing), focus in the cat-clause is still not licensed.

(30) a. [what nuclear engineers danced with Mary]$_1$
      b. [[the cat]$_F$ is on the mat]~1
      c. [Since [[the cat]$_F$ is on the mat]~1 [none did]~1]

The right move here is to accept that question alternative sets are world-dependent. This is explicit in the analysis of indeterminate pronouns in Kratzer and Shimoyama (2002). They give the semantics (31) for the Japanese indeterminate pronoun *dare*, which has a use as a wh-pronoun. Here the alternative set of individuals contributed by *dare* varies from world to world, since there is reference to the world of evaluation w in the restrictive clause of the set abstraction.

(31) $[\![\text{dare}]\!]^{f,w,g} = \{ y \mid \textbf{human}(w, y) \}$

Using the same definition for *who* results in the denotation given in (32a) for the question in (29a). Here I have switched to a notation for propositions that has explicit reference to worlds. $\lambda v.\textbf{walkwith}(v, y, \textbf{m})$ is the set of worlds v in which y walks with Mary; this was earlier written $\textbf{walkwith}(y, \textbf{m})$, without any commitment to modelling propositions as sets of worlds. The set (32a) is world sensitive, because there is reference to the world of evaluation w in the restriction of the set abstraction.

(32) a. $[\![\text{who walks with mary}]\!]^{f,w,g} = \{ \lambda v.\textbf{walkwith}(v, y, \textbf{m}) \mid \textbf{human}(w, y) \}$
      b. $[\![\text{Justin}_F \text{ walks with Mary}]\!]^{f,w,g} = \{ \lambda v.\textbf{walkwith}(v, y, \textbf{m}) \mid y \in D_e \}$

(32b) gives the focus denotation for the answer in the same notation. This set is not world sensitive. Nevertheless for any world w, the question alternative set (32a) is a subset of the

focus alternative set (32b). Applying the constraint in each world is exactly what falls out if the congruence constraint is modelled as a presupposition. For comparison, consider the semantics of the second sentence (33) in an extensional semantic model of presuppostion. The sentence intuitively presupposes that Kim is male. This is captured in an extensional model by the assignment of the third (undefined) truth value when Kim is not male in the world of evaluation. While this semantics of presupposition is extensional, in the pragmatics, a common ground model of presupposition can be applied, by checking the presupposition in each world that is an element of the context set of the common ground. This captures the fact that the discourse is perceived as taking for granted that Kim is male.

(33) Have you heard? Keisha is dating Kim$_2$. Go figure. The guy$_2$ is expert at tango and she hates to go out.

So, if it is formalized semantically as a distributive presupposition that places a constraint on a world, it falls out of the pragmatic interpretation of such presuppositions that the constraint gets imposed in all worlds of the context set. This addresses the worries about the question alternative set not being stable, and about the focus constraint being trivial in some cases.

Summing up, to fit alternative semantics for focus in with a generally Hamblin-like alternative semantics for questions, the restricting version of Hamblin semantics for questions has to be used. Hamblin's official conjoining option does not result in values that satisfy the presupposition of the focus reduncancy operator in configurations of question–answer congruence.

2.4 Entailment semantics

According to Section 2, the presupposition of the focus-scope operator is satisfied when the indexed antecedent is an alternative to the semantic value of the argument of the operator, or a set of alternatives. This section looks at a different licensing condition due to Schwarzschild (1999). This says that the semantics of the antecedent should *entail* a semantic object derived from the focus semantic value of the scope of the operator, in a certain generalized sense.[13] Consider the example repeated in (34). The first step is to derive the *focus closure* from ϕ. This is a proposition with existentially quantified variables in the position of each free F. Formally, it can be obtained as the

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[13] Schwarzschild's proposal was cast in a different way from the framework under discussion here. See Rochemont (this volume) for a presentation of this Givenness framework. A couple of aspects of Schwarzschild's proposal are independent of the entailment condition. The most important of these is the hypothesis that the redundancy operator need not scope over F. In (34), the pronoun *it* is destressed, and this is attributed to the pronoun being 'given' relative to its antecedent *calculus*, in the same sense that the scope of an F is given or redundant with respect to its antecedent. Under the scheme presented here, the pronoun is represented as [it$_4$ ~ 4], with the operator ~4 not scoping over F.

union of the focus semantic value, $\cup \llbracket \phi \rrbracket^{\,f}$. Next, entailment is checked between the antecedent and this closure. In this case, the antecedent proposition 'Newton invented calculus' does entail the closure 'some entity invented calculus', and the representation is licensed.

(34)   [Newton invented calculus$_4$]$_2$. [Leibniz$_F$ invented it$_4$]~2.

So, in cases where both the antecedent and ϕ have propositional type, the presupposition introduced by the configuration [$\phi \sim k$] is that the antecedent proposition entails the focus closure for ϕ. Look now at (35), where for the sake of argument we assume that the focus on *Canadian* takes scope at NP. This constituent has the property type, rather than a propositional one. Here it is proposed that the property type is lowered to the propositional one, by existentially quantifying the argument. The same type adjustment is performed for the antecedent. The result in this case is the proposition 'there are American farmers' for the antecedent and for the scope (applying also focus closure) 'there are farmers'. The former entails the latter, and the constraint is satisfied.

(35)   Every [American farmer]$_3$ is a [$_{NP}$ Canadian$_F$ farmer]~4.

Neatly, type shifting works out even in question–answer congruence, where the antecedent is a question, providing that Karttunen's semantics for questions is used, where the question alternative sets are restricted to true propositions (Karttunen 1977). In (36), the existential closure of the antecedent relative to a base world w is the proposition that there is some proposition of the form 'y invented calculus' that is true in w such that y is a person in w. This is equivalent to 'some person invented calculus', while the focus closure for the scope is 'some entity invented calculus'. Since these stand in the relation of entailment, the indexed redundancy operator is licensed.

(36)   [Who invented calculus$_4$]$_2$. [Leibniz$_F$ invented it$_4$]~2.

So far we have not seen any cases where entailment licensing and alternative licensing give different results. A simple one is where the antecedent is existentially quantified (Rooth 2005). Since somebody eating the cake entails some entity eating it (the latter is the focus closure), the representation (37) is licensed. But if we try alternative licensing, the proposition 'somebody ate the cake' is neither a proposition of the form 'y ate the cake', nor a set of propositions of that form.[14]

(37)   [Somebody ate the cake$_4$]$_2$. Yea, [Gottfried$_F$ ate it$_4$]~2.

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[14]   This counterexample is undone if existential quantifiers contribute alternative sets. See Section 2.6. Also, it is somewhat plausible to posit an accommodated question 'who ate the cake' following the first sentence. This would serve as the antecedent.

For an argument the other way, we can exploit the fact that focus and existential closure of the scope result in weak existentially quantified propositions, so it can be too easy for an arbitrary antecedent to entail them. In (38b), there is focus on the noun *cat*, with sentence scope. In (38c), there is focus within the subject generalized quantifier, and taking scope at it. In both cases, the closure procedure results in trivial propositions. (39a) is the focus closure obtained in (38b). This is necessarily true. Here is the reason. Every entity that tasted the flounder fillets tasted the flounder fillets. Therefore the property of tasting the flounder fillets serves as a witness for the existential quantifier $\exists P$. Since (39a) is necessarily true, it is entailed by any antecedent, and the licensing condition for the pair (38a,b) is satisfied. This is a bad result. In the pair (38a,c), argument closure as well as focus closure apply, because the scope is a generalized quantifier, rather than a proposition. This results in the closure (39b), which by similar reasoning is trivially satisfiable. So the representation (38a,c) is licensed, again a bad result.

(38) a. [I left some flounder fillets$_4$ on the counter]$_2$
      b. [[[every cat]$_F$]~ 2 tasted them]~2
      c. [[every [cat$_F$]]~ 2 tasted them$_4$]

(39) a. $\exists P. \forall x. P(x) \rightarrow \mathbf{taste}(x, g(4))$
      b. $\exists P. \exists Q. \forall x. P(x) \rightarrow Q(x)$

Summing up, generalized entailment is another proposal for the presupposition of ~k. Relative to the alternatives presupposition from Section 2, it has some advantages and some disadvantages. There is a need for deeper investigation of this issue.

2.5 TOPIC ALTERNATIVES

This section looks at an extension of alternative semantics that posits a higher level of alternatives, consisting essentially of alternatives to alternative-sets. This was proposed in Büring (1997) as a way of theorizing about the discourse pragmatics of contrastive topics. As discussed in Büring (this volume) and Velleman and Beaver (this volume), discourses involving multiple wh-questions and sub-questions can trigger answers that combine focus with an additional prominent element, called the contrastive topic. In sentence (40), focus on *Manny* correlates with the wh-position in the immediately preceding question. Contrastive topic on the subject is somehow triggered by the complex discourse context. Example (41) illustrates that the pattern can be reversed, with focus followed by contrastive topic (Jackendoff 1972). Contrastive topic and focus strike many speakers as different prosodically, and experimental work has shown that they can be pronounced in ways that differ consistently in pitch contour (Liberman and Pierrehumbert 1984). Current accounts that use the phonological tone model from Pierrehumbert (1980) transcribe the topic constituent L+H* within

a phrase with L–H% boundary tones, and the focus as H* within a phrase with L–L% boundary tones.[15]

(40) (who came with whom?)
What about Anna? Who did she come with?
$Anna_{CT}$ came with $Manny_F$.

(41) (who came with whom?)
What about Manny? Who came with him?
$Anna_F$ came with $Manny_{CT}$.

In (40) and (41), the answers are congruent with the questions they answer, if CT is ignored. Therefore it can be hypothesized that the CT feature does not affect focus semantic values, and that congruence is represented with indexing to the question as before. Suppose the extra contribution of contrastive topic is conceptualized as a contrasting question, which is also represented with an index. The contrasting question stands in a relation of substitution contrast with the focus antecedent, with substitution in the CT position. This leads to representations like (42) and (43), with an additional argument of the focus redundancy operator. In both cases, the question with index 4, namely 'who did Keisha come with' can be obtained from the question with index 2, namely 'who did Anna come with', by making a substitution in the CT position.

(42) (who came with whom?)
[who did Anna come with]$_2$
[$Anna_{CT}$ came with $Manny_F$]$_3$ ~2,4
([who did Keisha come with]$_4$)

(43) [who did Keisha come with]$_4$
([who did Anna come with]$_2$)
[$Anna_{CT}$ came with $Manny_F$]$_3$ ~2,4

In each of these representations, one antecedent is overt, and the other accommodated. In dialogue (42), we can conceive of the question with index 4 as a question which remains open, under the general discourse topic of who came with whom. In dialogue (43), the respondent switches the discourse topic from the question of who Keisha came with to the question of who Anna came with. The focus antecedent is accommodated, while the contrastive topic antecedent is the overt question.

Adding CT adds another dimension to the compositional problem. Büring (1997) followed the recursive strategy by defining an additional alternative semantic value $[\![\cdot]\!]^t$. The focus semantic value of [$Anna_{CT}$ came with $Manny_F$] can be conceptualized as the Hamblin question 'Anna came with what entity'. The topic semantic value is then

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[15] Among studies concerned with the semantics interface for prosodic phonology, see Steedman (2000, 2014), Büring (2003), and Constant (2012).

obtained by making substitutions in the CT position, yielding the set of Hamblin questions of the form 'z came with what entity', where z is an individual. (44) gives recursive clauses defining topic semantic values.[16] The third line defines the topic semantic value for a topic-marked phrase as the set of singleton sets of elements of the semantic domain for the phrase. In our example, this generates questions with individual substitutes for the topic-marked phrase subject, for instance 'Keisha came with what entity' and 'Hannah came with what entity'. The second line defines the topic semantic value of an F-marked phrase as the unit set of the focus semantic value. This has the effect of making elements of the topic semantic value look like the focus semantic value in F positions. For instance, the element 'Hannah came with what entity' of the topic semantic value has variation in the position of the object of *with*, just like the focus semantic value 'Anna came with what entity'.

(44) (i) $[\![\alpha]\!]^t = \{\{[\![\alpha]\!]^o\}\}$,

  if α is a terminal that is not F-marked

(ii) $[\![\alpha_F]\!]^t = \{[\![\alpha]\!]^f\}$

(iii) $[\![\alpha_{CT}]\!]^t = \{\{y\} \mid y \in D_\tau\}$

(iv) $[\![[\alpha\beta]]\!]^t = \{c \mid \exists a \exists b. a \in [\![\alpha]\!]^t \wedge b \in [\![\beta]\!]^t \wedge c = \{F(x, y) \mid x \in a \wedge y \in b\}\}$,

  where $[\alpha\beta]$ is not F-marked or CT-marked.

  F is the semantic operation for $[\alpha\beta]$.

The two-place redundancy operator can now be defined as in (45). j is the index of the local question. As before, this question is presupposed to be a subset of the focus semantic value. k is the index of the contrasting question. The contrasting question is selected from the topic semantic value, which can be thought of as the set of potential contrasting questions. The subset condition is included to allow for contextual narrowing of the contrasting question, just as for the congruent question.

(45) $[\![\phi \sim j, k]\!]^g$ presupposes that $g(j)$ is a subset of $[\![\phi]\!]^f$ and that $g(k)$ is a subset of an element of $[\![\phi]\!]^t$ that is distinct from $[\![\phi]\!]^f$.

This formulation allows possible contrasting question antecedents to be characterized semantically, just like focus antecedents, and licenses the representations (42) and (43)[17]. This assumes that the presupposition associated with CT is satisfied by the presence in the discourse representation of a question that satisfies the semantic constraints

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[16] Section 3.3.1 of Büring (1997) gives a definition along these lines that also deals with free variables and lambda.

[17] Another feature of recent work is the hypothesis that *both* the local and contrasting questions are drawn from the topic semantic value, using the fact that by construction, the focus semantic value is an element of the topic semantic value (Büring 2003). This move is motivated by a desire to characterize possible antecedent questions in a maximally general way.

on the antecedent. Much of the literature, however, works with more specific constraints which say that question antecedents have to be in specific positions in a tree-structured model of discourse state. See Roberts (2012), Büring (2003 and this volume).[18]

This is a good place to talk about the discourse pragmatics that goes with the locus/scope/antecedent representation for focus from Section 2.2, and the semantic interpretation for it from Sections 2.2 and 2.4.[19] Those interpretations took the form of presuppositional contraints on the antecedent k in the configuration $[\phi \sim k]$. A constraint is placed on the semantic object k: it is required to be an alternative to $[\![\phi]\!]$ in the sense defined by the focus semantic value, a set of alternatives, or in the formulation from Section 2.4, to entail the focus closure for ϕ in a generalized sense of entailment. Eligible antecedents for k are discourse referents that have the right semantic type, and which satisfy the focus constraint. Pragmatically, a speaker who uses a sentence containing focus and $\phi \sim k$ signals an intent to assume a discourse representation containing an antecedent that is identified by indexing, which should be salient in the same way that antecedents for pronouns and anaphoric definite descriptions are salient. Discourse referents that provide antecedents for focus can be projected from syntactic phrases. They can also be constructed, as exemplified by the accommodated question antecedents marked with parentheses in (42) and (43).

2.6 MORE APPLICATIONS OF ALTERNATIVE SEMANTICS

The discussion so far has looked at the application of alternative semantics to intonational focus, with a short consideration of alternative semantics for questions. The same or a similar framework is applied to other phenomena in semantics and pragmatics.

Aloni (2003), Simons (2005), and Alonso-Ovalle (2006) have presented analyses in which natural language disjunctions contribute alternatives. The analysis in Alonso-Ovalle (2009) of conditionals such as (46a) is representative. It is argued that combining a boolean semantics for *or* with a minimal-change semantics for counterfactuals (Stalnaker 1968; Lewis 1973) gives bad results, because on reasonable assumptions about what worlds count as 'normal' or similar to our own, worlds where we have good

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[18] An alternative to the recursive dual-layer system of alternatives is given by Constant (2012), who works from a representation with a CT head that is realized by the contrastive topic boundary tones. It has two arguments, each of which embeds F constituents that are interpreted in alternative semantics in the normal way. In the structure in (i), both the contrastive topic and the focus are analysed as bearing F features. The distinction between the two is encoded in the semantics of CT, which manipulates focus semantic values.

(i) Anna$_F$ CT e$_1$ came with Manny$_F$.

[19] Sæbø (this volume) articulates a discourse-pragmatic model along these lines.

weather are much more normal than ones where the sun grows cold. With this background assumption, sentence (46a) comes out as equivalent to (46b). Instead it seems to be equivalent to (46c).

(46) a. If we had had good weather this summer or the sun had grown cold, we would have had a bumper crop.
  b. If we had had good weather this summer, we would have had a bumper crop.
  c. If we had had good weather this summer, we would have had a bumper crop and if the sun had grown cold, we would have had a bumper crop.

Alonso-Ovalle analyses these data using the hypothesis that the material inside the if-clause, instead of contributing a proposition, contributes the set of propositions containing 'we have good weather this summer' and 'the sun grows cold'. Then a quantificational semantic rule for the way that *if* combines with the clause headed by *would* is stated, which has the effect of using the elements of the alternative set independently as restrictions for *would*, in order to obtain a reading equivalent to (46c).

Krifka (1995) introduced the hypothesis that 'weak' negative polarity items such as *any* introduce alternatives into the semantic derivation. Negative polarity items (NPIs) occur in restricted environments, characterized by Ladusaw (1979) as downward entailing environments. These include the environments (47a–c), but not the hash-marked environments (47d–e), where the sentence is possible only with a generic interpretation. The alternatives generated by [any NP] are those obtained from sub-properties of the property contributed by the NP. For the case in (47), these are sub-properties of ⟦cookie⟧, for instance the property of being a square cookie, the property of being a poisonous cookie, and the property of being a non-square cookie. These alternatives propagate in the way described in this chapter. On the assumption that *any* is semantically an existential quantifier, (48a) is the ordinary semantics of the clause (47e). In addition we get the set of alternatives of the form described in (47b).

(47) a. Justin didn't eat any cookies.
  b. Nobody ate any cookies.
  c. Everyone who ate any cookies felt good.
  d. #Somebody ate any cookies.
  e. #Justin ate any cookies.

(48) a. $\exists x.\mathbf{cookie}(x) \wedge \mathbf{eat}(\mathbf{j},x)$
  b. $\exists x.Q(x) \wedge \mathbf{eat}(\mathbf{j},x)$, where Q is a sub-property of **cookie**.

The remaining part of the theory is a principle that restricts the distribution of NPIs by referring to alternative sets. For Krifka, this is a principle of *scalar assertion*, which says that all alternatives that are not entailed by the ordinary semantics are false. For (47e) this turns out to be a contradictory requirement, which is hypothesized to be responsible for the oddity of the sentence. If Justin ate some cookies, then either he ate some

square cookies, or he ate some non-square cookies. So these two alternatives (neither of which is entailed by the ordinary semantics) could not both be false. On the other hand, looking at (47b), nobody eating cookies is perfectly compatible with nobody eating square cookies and nobody eating non-square cookies.[20]

These applications of alternative semantics are formally similar to alternative semantics for focus, in that they involve alternatives that are launched from specific positions, propagated compositionally, and then interpreted by certain operators. Currently there is not enough understanding of how these systems of alternatives relate to each other in the grammatical system. One issue is that disjunction and weak NPIs usually show default prosody or are de-stressed, so that it is difficult to analyse them as systematically involving focus of the prosodic kind.

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[20]   Subsequent literature has suggested that the scalar exclusive operator is a phonetically null operator in the compositional structure, similar to *only* (Chierchia 2013).

CHAPTER 3

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GIVENNESS

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MICHAEL ROCHEMONT

3.1 INTRODUCTION

....

GIVENNESS has many forms and functions.[1] In all its uses, givenness ties some linguistic property of an expression, its syntactic form or position or its prosody, to the informational or cognitive status of its denotation as already present in the discourse model in some sense. Differing uses reflect the differing ways in which an expression or its denotation may be said to be already present. Consider, for instance, the two self-contained mini-discourses in (1), where (1a) is followed by either of (1b,c) (Chafe 1976: 41).

(1) a. John and Mary recently went to the beach.
     b. They brought some picnic supplies, but they didn't drink the beer because it was warm.
     c. They brought some beer, but they didn't drink the beer because it was warm.

Proper nouns, such as those in (1a), usually identify entities that the speaker takes to be already known to the other participants in the conversation. Such assumed familiarity is critical to the speaker's successful communication of the content of the proposition to her audience. Generally, the felicitous use of names and definite descriptions (*the beach, the beer*) requires that the entities they designate be familiar or at least uniquely identifiable. For the participants of the two discourses in (1), John and Mary must be 'given' in this sense, as must the beach and the beer. The expression *the beer* in the second conjunct of (1b) uniquely identifies a referent through 'bridging' (Clark 1977) to the picnic supplies introduced in the first conjunct: the beer is understood as one of the supplies just mentioned, given the interlocutors' general knowledge of what sorts of supplies

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picnic supplies may consist of. This sense of givenness (familiar, identifiable) is a distinguishing property of definite noun phrases generally, and various types of (in)definiteness marking signal the varying degrees to which, or manner in which, the referent of a particular noun phrase may be reliably tied to the background of commonly held knowledge of individuals, events and meanings shared by the participants in a specific discourse (e.g. Prince 1981; Ariel 1990; Gundel et al. 1993).

But there is also a different sense of givenness exemplified in (1). As Chafe notes for parallel examples, there is a contrast in pronunciation between the second conjuncts of (1b,c). These sentences, although segmentally identical, form a minimal pair: in (b) *beer* is intonationally prominent (pitch accented), while in (c) *beer* is deaccented (it shows a complete lack of pitch prominence). Patently, what makes deaccenting possible in the second conjunct in (c) is the prior mention of beer in the first conjunct.[2] This requirement for a situationally salient antecedent for the deaccented expression also reflects a form of givenness. But since both instances of *the beer* in (1b,c) are definite, deaccenting must reflect a different notion of givenness than that which marks the use of a nonpronominal definite noun phrase. In particular, no deaccenting of *the beer* is possible in the second conjunct in (b) despite the ready accessibility of a uniquely identified referent.

One way in which shared knowledge is represented is through Common Ground (CG), a notion originally proposed by Robert Stalnaker in the early 1970s. CG is the set of propositions and entities that are shared among interlocutors in a conversation and whose content is updated as the conversation proceeds. Krifka (2008) distinguishes CG Content, construed in this way, and CG Management.[3] CG Content records and updates the shared knowledge and beliefs of interlocutors, while CG Management is concerned with the immediate and temporary informational needs and communicative goals of interlocutors, governing how CG Content should develop. Adapting Krifka's distinction between CG Content and Management, a plausible hypothesis is that it is the participants' shared beliefs about givenness in CG Content that license the use of *the beer* in (1b,c), but it is CG Management and beliefs about givenness in the conversation itself (that the beer referred to is salient or conspicuous in (1c) in a way that it is not in (1b)) that condition the possibility for deaccenting. From this perspective deaccenting is a device of CG Management that is dependent on the situational (hence temporary) salience of an antecedent, rather than on CG Content. It is this CG Management notion

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[2] Cruttenden (2006: 314) cites Walker (1781) and Bell and Bell (1879) for early recognition of this fact about English.

[3] Krifka is not alone in distinguishing elements of CG. Stalnaker (2002: 708) distinguishes two sorts of beliefs that are encoded in the CG as a conversation proceeds: '… beliefs about the subject matter of the conversation' and ' … beliefs about the conversation itself'. Stalnaker's distinction mimics the distinction drawn by Dryer (1996) between presupposition and metapresupposition and also parallels Kripke's (2009) distinction between active and passive context. Further, these distinctions are implicated in the taxonomy of projective content of Tonhauser et al. (2013). None of these proposals are equivalent, however, and I will not decide among them here. For concreteness I cast the discussion in terms of Krifka's proposal.

of givenness that will concern me in this chapter. To distinguish salience-based given-ness from other possible forms of givenness, I will refer to the former as *Givenness* (with a capital G).[4]

The view that deaccenting is conditioned by Givenness as an element of CG Management rather than Content finds support in consideration of the deaccenting of the presupposed clausal complements of factive predicates. Such presuppositions define propositions that for utterances that invoke them to be felicitous must be known to the interlocutors and not simply salient—they must form part of CG Content. The fol-lowing examples from Wagner (2012a) illustrate.[5] (Capitals mark accented words and underscoring marks deaccented strings.)

(2) Mary wanted to go swimming in the lake.

    a. She didn't realize that it was too COLD.
    b. #She didn't REALIZE <u>that it was too cold</u>.

(3) Although it was way too cold, Mary wanted to go swimming in the lake.

    a. She didn't REALIZE <u>that it was too cold</u>.
    b. #She didn't realize that it was too COLD.[6]

(4) Contrary to the facts, they told Mary that the lake was too cold and it was impos-sible to swim in it.

    a. #She never believed that it was too COLD.
    b. She never BELIEVED <u>that it was too cold</u>.

The clausal complements to the factive predicate *realize* in (2)–(3) encode the presup-position that it was too cold to go swimming, but deaccenting is possible only when this proposition is Given. The presupposed truth of the embedded proposition is neither

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[4] This notion of Givenness corresponds to Prince's (1981) givenness$_s$. Prince's givenness$_k$ more closely relates to givenness in CG Content. The former is recast in Prince (1992) as Discourse Old and the latter as Hearer Old. Many other terms have been used to name or include this sense of givenness: among others, *old, activated* (Chafe 1974, 1976; Lambrecht 1994; Dryer 1996; Beaver and Clark 2008), *contextually bound* (Sgall et al. 1973), *salient* (Prince 1981; Ward and Birner 2011), *c-construable* (Culicover and Rochemont 1983; Rochemont 1986), *presupposed* (Chomsky 1971; Jackendoff 1972; Zubizarreta 1998), *ground/tail* (Vallduví 1992; Vallduví and Engdahl 1996), *predictable* (Bolinger 1972; Kuno 1972), *topic* (Gundel 1988, 2003; Erteschik-Shir 1997, 2007).

[5] See Schmerling (1976), Allerton (1978), and Rochemont (1986) for parallel argument. The non-reduction of Givenness to presupposition is discussed by many other authors, including Prince (1981), Tancredi (1992), Dryer (1996), Büring (2004), Jacobs (2004), Gundel and Fretheim (2004), Kratzer (2004), Abusch (2008). In contrast, numerous authors propose to reduce Givenness to presupposition; see Zubizarreta (1998), Guerts and van der Sandt (2004), and Sauerland (2005) for different recent proposals to this effect. See Sæbø (this volume), Velleman and Beaver (this volume), and the collection of papers in *Theoretical Linguistics* 30.1 (2004) for extended discussion.

[6] This example may be improved in this context by the use on *cold* of the HLH accent that is normally used to mark a Contrastive Topic (Büring, this volume).

necessary (4) nor sufficient (2)–(3) for deaccenting. If deaccenting is conditioned by salience, a notion of CG Management, then the relative salience of a proposition is unrelated to its accepted truth, this latter an issue of CG Content.

A similar demonstration is provided by the examples below from Kratzer (2004) (citing Christopher Potts).

(5) a. *Sue doubts that Ed attended the meeting, but/and we all agree that Jill <u>attended the meeting</u> too.
     b. Sue doubts that Ed attended the meeting, but we all agree that Jill <u>attended the meeting</u>.

Use of the operator *too* in the second conjunct of (5a) imposes a presupposition ($\exists x$ *[x attended the meeting]*) that cannot be satisfied by the first conjunct, which does not assert that Ed attended the meeting. But as the felicity of deaccenting in (5b) shows, the failure of assertion of this embedded proposition (and its corresponding update in CG Content) is irrelevant to its salience for purposes of deaccenting.

Examples (2)–(5) show a distinction between presupposition as commonly construed and salience. Dryer (1996) rightly objects that such examples do not yet show that salience (his *activation*) is not a form of presupposition that may be distinct from the more widely recognized presupposition that derives from a lexical factive or additive element, for instance. It remains possible that deaccenting presupposes not that the relevant proposition is accepted/true, but instead that it has a local legitimate antecedent in the ongoing conversation/context. (Dryer refers to this form of presupposition as *metapresupposition*.) And indeed, the prevailing assumption among analysts seems to be that Givenness is presuppositional in nature, although it is not quite clear how. After all, Givenness projects across environments that block presupposition projection in other cases: (5) shows us that the metapresupposition of a Givenness antecedent projects even when the closely similar (if not identical) presupposition that the additive particle *too* introduces does not. Presuppositions like the existential presupposition introduced by *too* in (5a) are generally modelled in CG as conditions on the input CG that must be satisfied for the utterances that invoke them to be able to update the CG. In terms of Krifka's distinction of types of CG function, such presuppositions are based in CG Content. In contrast, Dryer's metapresupposition would be cast in terms of CG Management, governing the temporary nature of salience-based presupposition in ongoing discourse. Givenness conditioned deaccenting can then be seen as presuppositional in the latter sense only—it expresses a presupposition of a situationally salient antecedent of a particular sort, an effect of CG Management rather than a condition on CG Content.

In what follows, I will use deaccenting as a probe into the precise nature of Givenness. Before proceeding, three caveats about deaccenting are in order. First, it is important to observe that while Givenness is necessary for deaccenting, it is not sufficient. In each response in (6), the italicized phrase is Given in virtue of its mention in the question, but deaccenting it would be distinctly odd in this context. In general, deaccenting is overruled by considerations of focus (Rooth 1992, this volume), regardless of the Givenness

status of a candidate expression. (We return to the relation between focus and Givenness in Section 3.3.3.)

(6) a. {Do you like coffee or tea?} I like *tea*.
     b. John's mother slapped Mary, and then she slapped *John*.
     c. Susan's sister likes everyone. She even likes *Susan*.

Second, as (7) shows, deaccenting of a salient expression, when possible, is mandatory only when the expression follows a nuclear accent, or might itself bear the nuclear accent were it not given. In pre-nuclear position, expressions whose denotations are Given (and not focused) may be deaccented, but need not be (see Horne 1990, 1991; Gussenhoven 1999).

(7) {Mary met a student from her class at a social event.}

     a. The student from her class asked her to DANCE.
     b. She DANCED with the student from her class.

The student from her class, if it is understood as coreferential with the student introduced in the context sentence, may be either accented or deaccented in (7a), whereas it seems it must be deaccented in (7b). Given this difference, I adopt the practice of (re-)fashioning examples that test deaccenting so that relevant candidates consistently appear in post-nuclear position.

   Third, I will deal here only with the Givenness of denotations and/or (the mental representations of) their referents. Nevertheless, it has been known since at least Williams (1981) that sometimes it is the form of an expression and not its meaning that acts as Given for the purposes of deaccenting. Examples (8) and (9) below from Williams (1981) and Wagner (2012b), respectively, illustrate.

(8) ?John does not usually give advice to his SON, but he did recently tell him not to look at the SUN.

(9) a. Clara loves the public and Clara is loved by them.
     b. Clara loves the public and Clara is loved by the public.

Although the informational content is the same in both examples in (9), (9a) tolerates an accent on *them* whereas this same pronunciation with an accent on *public* is distinctly odd in (9b). It is evident from Williams' example (8) that it is the repetition of form rather than content that triggers the effect. Wagner labels this 'a givenness illusion' and reports on experimental results confirming this effect. The illusion (Wagner 2012b: 1443) is due to the possibility that '… accenting phonologically given material is avoided, even at the cost of not marking a contrast'. I will not be concerned in this chapter with such givenness illusions. The reader is referred to Williams (1997) and Wagner (2012b) for proposals regarding such cases.

The question we turn to next is, what are the precise conditions that define salience based Givenness? In (1c), for instance, the expression *some beer* that serves as antecedent for the deaccented *beer* is segmentally identical to it. But, as shown below, not all cases of deaccenting are conditioned by such identity. We are left again with the question why *beer* counts as salient in (1c) but not in (1b). In Section 3.3.2 we examine the semantic relations that qualify an expression as salient for the purposes of Givenness, using deaccenting as a diagnostic.

3.2 SEMANTIC RELATIONS

3.2.1 Entailment and coreference

Schwarzschild (1999) posits the relevance to Givenness of two core semantic relations: coreference (10) and entailment (11)–(13) (see also Rochemont 1986).

(10) John's sister doesn't LIKE <u>John</u> / <u>him</u> / <u>the bastard</u>.

(11) a. Where are those groceries I *paid for*? Actually, JOHN <u>bought them</u>.
      b. First John *carried the vase upstairs*, then MARY <u>moved it</u>.

(12) a. John traps *gorillas* and he also TRAINS <u>animals</u>.
      b. John *had a sister* before MARY <u>had a sibling</u>.

(13) a. #John traps *animals* and he also TRAINS <u>gorillas</u>.
      b. #John *had a sibling* before MARY <u>had a sister</u>.

The deaccented proper noun, pronominal and epithet objects in (10) are all understood as coreferential to the proper noun possessor of the subject noun phrase. In (11), each deaccented constituent is entailed (in terms of set inclusion) by its italicized antecedent. In (12), entailment predicts the potential for deaccenting the hypernym on the basis of its hyponym. Where entailment fails to hold in (13) (that is, from hypernym to hyponym), deaccenting is illicit. In Schwarzschild's proposal, entailment is strictly a relation between propositions that is facilitated by a mechanism of type-lifting existential closure ($\exists$-type shifting) to raise non-propositional denotations apart from e to the type of propositions, for calculating Givenness. An utterance U is then *Given* if (i) U is entailed (modulo $\exists$-type shifting) by a valid antecedent A in the discourse, or (ii) U is of type e and U and A corefer.[7] For example, in (12a) *animal* is deaccented because $\exists x\,[animal\,(x)]$

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[7] Is it possible to reduce coreference based salience to entailment? This could be done by type shifting e type denotations to the type of predicates (Partee 1987) and subjecting them to $\exists$-type shifting. Hotze Rullmann (p.c.) suggests two further possibilities: treating individuals as generalized quantifiers or reformulating entailment as a relation between denotations of any type (van Benthem 1986). The failure of definite pronouns to bear an accent except when contrastive may be due not to coreference with a

is entailed under ∃-Closure by the mention of *gorilla* in the first clause. Importantly, the relevant entailments are not necessarily logical entailments of the discourse, but rather entailments under ∃-type shifting from what is salient in prior discourse. (See also (19).)

Many accounts of Givenness (e.g. Dryer 1996) propose a three-way distinction between active, non-active, and semi-active (or *accessible*) denotations (like the beer in (1b)). A denotation is said to be accessible if it bears a pragmatic (e.g. functional or meronymous) relation to a locally prior denotation. For instance in (14), comparable to (1b), the driver is said to be accessible due to the prior mention of the bus.

(14)   When I boarded the bus, I thought I recognized the driver.

But notice that the possibility for deaccenting shows that the accessible referent denoted by *the driver* is not Given in the preferred sense needed for deaccenting: *driver* in (14) is not possibly deaccented despite being accessible.[8] This is predicted if deaccenting is licensed specifically by entailment. More generally, the relation between meronym and holonym, unlike the relation of hyponym to hypernym, is not a relation of entailment. It is thus predicted that deaccenting is not generally licensed by meronymy or holonomy, as the following examples confirm.

(15)   #If you knock on the door, you can ENTER the room.
       #When the engine died, I JUNKED my car.
       #John takes pictures of steeples, and he PAINTS churches, too.
       #If I give you the oars, you have to FIND the rowboat.

(16)   #If you want to enter the room, you have to KNOCK on the door.
       #My car broke down. I forgot to OIL the engine.
       #John takes pictures of churches, and he PAINTS steeples, too.
       #When I got out of the rowboat, I FORGOT the oars.

Notably, (15)–(16) improve when the main stress is shifted to the deaccented phrase, whose denotation is evidently not salient despite being accessible.

Deaccenting under entailment or coreference can give rise to inferences about speaker's meaning, as in this famous example from Lakoff (1972).

(17)   John called Mary a Republican and then SHE insulted HIM.

If *insulted* can only be deaccented under entailment, then calling someone a Republican must entail insulting her. Here the entailment is not logical, but speaker defined (van

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salient antecedent but to the failure of functional categories (analysing pronouns as Ds) to be parsed in the mapping of syntax to phonology unless specifically stressed.

[8]   This does not rule out the possibility that accessible denotations might yet find distinct prosodic expression, as claimed by Baumann (2006), Baumann and Grice (2005).

Deemter 1994) and inferentially available to interlocutors who may not otherwise share it: if *insulted* is deaccented then its meaning must be Given, hence entailed by a prior (effectively type-compatible) antecedent, for which there is but one candidate in (17).[9]

Inferencing from coreference conditioned Givenness is also possible, as in (18).[10]

(18) a. On my way home, *a dog* barked at me. I was really FRIGHTENED by <u>the fierce German shepherd</u>.
 b. Did you see *Dr. Cramer* to get your root canal?
 Don't remind me. I'd like to STRANGLE <u>the butcher.</u>
 c. *My neighbour* is a funny character. Still, I really LIKE <u>John</u>.
 d. *The crowd* approached the gate. The guards were AFRAID of <u>the women</u>.
 e. *The children* were up late. I'm reluctant to WAKE <u>the boys</u>.
 f. John had *an old farm*. He SOLD <u>the shed</u>.

In each case, if the underlined phrase is deaccented, then it is understood to co-refer with the italicized antecedent; if the phrase is instead accented, it may not co-refer (though in (18d,e), it may specify a subset). Van Deemter (1994) argues for expanding the notion of anaphor to allow the deaccented expression in such cases to be anaphorically dependent on the antecedent (see also Williams 1997, 2012 for a different such proposal). It would seem odd, however, to characterize (18c) for instance as a case where the deaccented proper noun is anaphorically dependent on the prior descriptive noun phrase. The inference instead seems to be that both expressions refer to the same entity.

3.2.2 Other putative relations for Givenness

The conclusion that Givenness is a function of entailment/coreference is consistent with the conclusion that Givenness is to be distinguished from topic-hood (Halliday 1967; Krifka 2008; Kučerová and Neeleman 2012).[11] I want now to argue that several other notions that have been appealed to for Givenness are similarly inappropriate. For instance, appeal is sometimes made to Ariel's (1990) notion of accessibility as the conditioning factor in deaccenting (e.g. Reinhart 2006). But accessibility in Ariel's use functions like the givenness of the Givenness Hierarchy (Gundel et al. 1993): degree of accessibility is

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[9] It is thought that deductive inference under entailment from what is asserted can also motivate deaccenting. In (i) such inference seems to be sufficient for deaccenting, but does not so readily license pronominalization.

(i) I know I bought 11 marbles, but when I got home I found I only had 10. And then I found <u>the missing marble</u> /#it in my POCKET.

[10] These examples are modelled on or borrowed from Ladd (1980), van Deemter (1994), Umbach (2001), Büring (2007), Baumann and Riester (2012).
[11] For analyses in terms of topic-hood see Gundel (1988, 2003), (Lambrecht 1994), Erteschik-Shir (1997, 2007), for example.

correlated with the likelihood or possibility of appearance of a particular form of refer-ring expression, like the contrast between pronouns and full referential descriptions. Deaccenting is overall insensitive to distinctions among referring expressions in these terms. This perspective belies a widespread claim in the literature that definite noun phrases are consistently Given and indefinite noun phrases consistently lack Givenness. In contrast, like other constituents, definite noun phrases are typically accented when dis-course new and deaccented when Given (modulo the usual exemptions from deaccent-ing), as is evident already from Prince's (1981) discussion of her category of Unused noun phrases (see also Brown 1983; Bosch 1988; Terken and Hirschberg 1994; Umbach 2001).

Moreover, it is readily possible for an indefinite noun phrase to be deaccented, as in (19).

(19)   If John paints a hot dog, Sam will EAT <u>a hot dog</u>.

There is no hot dog introduced by the conditional clause of (19) that serves as a ref-erential antecedent for the deaccented second instance. Compare (20a), where the underscored indefinite noun phrase in the second clause is deaccented in virtue of the entailment licensing antecedent *a dog* in the first clause.

(20)   a.   Peter had a DOG long before I <u>had a pet</u>.
       b.   My parents let me KEEP <u>Sam</u>, though they never really WANTED <u>a cat</u>.

In (20a) two new discourse referents are introduced—Peter's dog and my pet. Evidently even a deaccented indefinite noun phrase (*a pet*) can introduce a new discourse referent. In addition, in arguably enthymematic fashion, subsequent references to my pet (the under-scored phrases in (20b)) can yet be deaccented, even though each introduces new informa-tion about this discourse referent. I conclude that neither definiteness nor indefiniteness are uniquely or predictably associated with accenting or deaccenting independent of salience.

Analysts also sometimes use the term *D-linked* to refer to Given in the intended sense. But D-linking (Pesetsky 1987), to the extent that is it well defined, is independent of Givenness. In Pesetsky's analysis, *which*-headed phrases in *wh*-questions are D-linked, as indicated by their exemption in (21c) from Superiority effects (21b). As Rochemont (2013b) observes in relation to (22), D-linking cannot be co-extensive with Givenness, since *which* phrases are uniformly D-linked while still expressing possible distinctions in Givenness via deaccenting.

(21)   a.   Who bought what?
       b.   *What did who buy?
       c.   ?Which teacher did which student talk to?

(22)   We know you bought a car, …

       a.   but we don't know WHICH <u>car you bought</u>.
       b.   but we don't know which MODEL <u>you bought</u>.

(23) a. The teachers have been assigning specific books to specific students.
          ?Mary asked WHICH <u>teachers</u> WHICH <u>students</u> REPORT to.

      b. The teachers have been assigning specific books to their charges.
          ?Mary asked WHICH <u>teachers which</u> STUDENTS REPORT to.

      b. Specific books are being assigned to specific students.
          ?Mary asked which TEACHERS WHICH <u>students</u> REPORT to.

Although judgements are subtle, the (b) examples in (23) are equally as grammatical as (21c) and in contrast to (21b), showing conclusively that *which*-phrases are D-linked for Superiority regardless of the Givenness distinctions among them. D-linking must therefore be independent of Givenness.

   Some analysts use the terms *predictable, repeated*, or *unimportant* to describe the type of Givenness that is relevant to deaccenting.[12] But these terms are ill-chosen for that function and, as a result, entirely misleading. Examples (17), (18), and (20) show that deaccenting is not restricted to repeated expressions nor to expressions that are presented as unimportant. *Predictability* is a more widespread term that is nevertheless as readily ill-chosen. First, predictability too encounters the problems faced by repetition and unimportance as predictors of felicitous deaccenting. For instance, in (17), (18), and (20) the deaccented expressions are not only arguably important but also unpredictable in that they add potentially new information about their antecedents. Moreover, predictability, when not confused with probability, is more often than not determined only post hoc when applied to deaccenting, even with expressions that are repeated.

(24) Mary, John, and Bill were sitting in the living room. All of a sudden, <u>Mary</u> KISSED <u>John</u>.

It is certainly not predictable in advance of the utterance of the second sentence in (24) that Mary did something to John or if Mary kissed anyone, she kissed John: she might have kissed Bill, the cat, or even the couch. And finally, when predictability does seem to have some predictive force, it is not generally associated with deaccenting, as in (25). The word *beak* in (25a) is fully predictable, but it is not possibly deaccented (without adding further context), as shown by the contrast in (25b).

(25) a. The chicken pecked at the ground with its _____.
      b. The CHICKEN pecked at the GROUND with its BEAK/#at the GROUND with <u>its beak</u>.

I conclude that neither predictability, nor repetition, nor unimportance sufficiently characterize Givenness.

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[12] Deaccenting is sometimes lumped together with 'prosodic reduction', but it may be that prosodic reduction is common with repeated or predictable expressions regardless of their status as accented or deaccented (e.g. Jurafsky et al. 2000).

In this section I have ruled out definiteness, D-linking, repetition, importance, and predictability as factors that categorically condition deaccenting. I conclude that Givenness is solely a function of coreference or entailment.

3.2.3   Givenness accommodation

We have seen in example (17), repeated below, that deaccenting by a speaker can support an inference on the part of the addressee. Let us now consider exactly how.

(17) John called Mary a Republican and then SHE <u>insulted</u> HIM.

In deaccenting *insulted*, speaker B presents its denotation as Given, a presentation that is not obviously true in (17). Rather, the addressee is led to infer that the speaker believes that to call someone a Republican is to insult him/her. What precisely is the source of this inference? The inference follows from the anaphoric Givenness presupposition introduced by deaccenting, which indicates the need for a salient antecedent that entails $\forall x, y$ [*x calls y a Republican→x insults y*]. In this case B is invoking *accommodation*, classically construed as a means of introducing an informative presupposition into a conversation (see Stalnaker 2002; von Fintel 2008 for recent discussion). B appeals to A to recognize that there is a situationally salient antecedent for the deaccented expression and to accommodate a proposition that allows that antecedent to entail the deaccented phrase under Existential Closure. An appeal to accommodation is subject to the restriction that it must be accepted 'quietly and without fuss' (von Fintel 2008). This restriction characterizes the difference between (17) and (26).

(26) John insulted Mary and then SHE <u>called</u> HIM <u>a Republican</u>.

Most speakers would not easily agree to accommodation of the proposition that is needed to render deaccenting felicitous in (26): $\forall x, y$ [*x insults y →x calls y a Republican*]. Accommodation gives a natural account of such cases as (17)/(26) and also of parallel cases of accommodation of coreference as in (18), and (20).

The naturalness restriction on accommodation, that it be accepted 'quietly and without fuss', emphasizes the inherently pragmatic nature of the process, thus readily characterizing its culturally and contextually sensitive variability. Accommodation displays other characteristic restrictions as well, related to this naturalness requirement. First, it is optional, in the sense that speakers are not required to use accommodation wherever possible. Rather, speakers may use locutions that directly alter the context, introducing the relevant meanings that would satisfy presupposition without the need for accommodation. Thus, except in cases where there is limited risk, speakers are typically conservative in their appeal to accommodation, for the reason that its use poses the risk that the speaker's contribution may be rejected by interlocutors who refuse to accept the appeal quietly and without fuss. A related restriction is that accommodation is sensitive to the specific intimacy of the interlocutors: in many cases greater

intimacy implies less risk on the part of the speaker, modulo the specific content to be accommodated.

The view that deaccenting may give rise to the need to accommodate in order to satisfy a presupposition of salience leads to a re-evaluation of cases which have otherwise often been characterized in strictly grammatical terms or in terms of notions like predictability or unimportance, such as so-called thetic sentences (27), Bolinger-style deaccenting (28), or discourse new though unaccented indexical locative and temporal expressions (29).[13] In our terms, the problem presented by such cases is this: if α must be Given to be deaccented, then α that is not Given (i.e. new) must be accented; but the literature claims that all of (27)–(29) can be used in contexts where the underscored constituents are both new and accentless.

(27) a. JOHN's here.
    b. My HAIR's a mess.
    c. Your MOTHER phoned.
    d. Your COAT's on fire.
    e. A COP pulled me over on my way to work today.
    f. There's a CAR coming / SKIDDING.
    g. I knew I would like it here—the STUDENTS are smart.
    h. A TRAIN whistled. / A PASSENGER WHISTLED.
    i. I think I hear the BABY crying / your HUSBAND CRYING.

(28) a. He's in jail because he KILLED a man / killed a POLICEMAN.
    b. I have a POINT to make / a point to EMPHASIZE.

(29) a. I ran into JOHN on the subway today.
    b. JOHN is leaving for LONDON this week.

Most accounts of such cases seek non-Givenness based sources for the lack of an expected accent. Among the grammatically based alternatives, one widely favoured proposal links theticity, for example, to the unaccusative/unergative contrast (but see (27 e,f,i)). Another links theticity to the stative/eventive distinction (*Your EYES are red/ BLUE*, but see (27g)). But if the only possible source of the lack of an expected accent is deaccenting and deaccenting is solely dependent on Givenness as analysed here, then these cases must have a Givenness-based source. Accommodation related to Givenness may provide an analysis consistent with this conclusion. One leading indicator is that accommodation is a pragmatic mechanism, with the potential flexibility to characterize the range of examples in terms other than predictability or unimportance. Accommodation is also not susceptible to the inherent flaw in the grammatically

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[13] For complete references and fuller discussion of the claims in the remainder of this section, see Rochemont (2013b).

driven accounts, that they are simultaneously too weak and too strong, as Rochemont (2013b) shows.

If the problem posed by (27)–(29) is fundamentally pragmatic, consider how the characteristic conditions on accommodation noted above give insight into an account of such cases. For one thing, judgements of acceptability vary as a function of levels of intimacy between interlocutors: (29a) would be judged less acceptable if it could not be taken as Given without comment that events regularly occur on the local subway system, or where there is no local subway for example. With thetic sentences it has been observed that in many cases deaccenting the predicate is optional. Since making appeal to accommodation can be a risky business, it only appears mandatory in cases where the risk is completely minimal. Compare (27a,c) with (27b,d,e,g) and the alternatives in (27f,h,i). Alternative pragmatic accounts that claim that the underscored phrases in (27)–(29) are either predictable or unimportant, while plausible for some examples ((27h,i) for instance), face severe difficulties with others: the unaccented predicate in (27e) is not necessarily predictable or unimportant, and that in (27d) is most certainly neither. Importantly, as both Stalnaker (1998) and von Fintel (2008) emphasize with accommodation generally, the adjustment to CG that accommodation demands is made only after the utterance that invokes the presupposition and before the update to CG content. Thus, the context that Givenness appeals to is not the virtually null context that precedes these discourse initiating utterances but the discourse initial context that includes these utterances (hence the contrasts between examples in (27h,i)). Predictability/unimportance are often considered appealing for such cases, but as already argued, these pragmatic notions fail to provide a general account.

This view of Givenness as a presuppositional device of CG Management contrasts with the way Givenness is often seen. A more traditional view is that when a speaker deaccents a string this leads to a recoverability problem for the addressee: recover a meaning that is sufficiently activated. Whether activation is sufficient is usually tied to limits of memory and attention: what is the span of time and/or distance between utterances that may suffice to allow a string to be seen as activated? The CG Management view of deaccenting presents the addressee's problem differently: which CGs are consistent with the presuppositional requirement of an antecedent for a constituent presented as Given? Here there is no issue of a timespan beyond which Givenness deaccenting is illicit under an intended interpretation. Rather, the addressee must select a CG that is compatible with the speaker's presentation. The only consideration is whether the speaker is successful in appealing to the addressee to construct an appropriate CG. Dryer's (1996: 501) discussion of an example due originally to Chafe (1976) illustrates. Adapting this example slightly, imagine that Sherlock Holmes, sitting quietly at the desk in his study, suddenly says to Watson, who is reading a newspaper, 'The BUTLER killed the Kingsdale widow!' As Dryer observes, one way to view this exchange is that Holmes is appealing to Watson to recover a context in which the relevant constituent (the VP) is Given, when the present context obviously does not qualify. Dryer refers to this process as 'activation accommodation' on the model of presupposition accommodation. As noted for presupposition accommodation generally,

Holmes' appeal succeeds only to the extent that the accommodation is made 'quietly and without fuss' (von Fintel 2008). If Watson is unwilling or unable to accommodate a CG with an appropriate antecedent, Holmes' appeal to accommodation will fail. But there is no issue of how long it has been since the expression has been uttered, as some absolute bound on persistence of activation. While it may be possible to determine some statistical measure of persistence of activation for certain purposes, such a measure is but a poor reflection of the actual state of affairs. This is that whether a particular use of deaccenting succeeds or fails will be strictly a function of the addressees' willingness or ability to construe under accommodation an antecedent for the deaccented expression in the current CG or to accommodate a different local CG which supplies an appropriate antecedent.

3.3   Given, new, and focused

So far in the discussion we have considered only cases where entire constituents are Given under entailment or coreference, under Schwarzschild's preliminary definition of Givenness. But Schwarzschild's ultimate proposal provides for cases where a phrasal constituent is only partly Given. He delivers an informal procedure in which constituents are checked for Givenness recursively, Given constituents are unmarked, and non-Given constituents are F-marked under an operation of Existential F-closure which replaces each F-marked constituent from within a potentially Given constituent with a variable, existentially closing the result to check for antecedence, modulo the need for ∃-type shifting. In order to avoid over-liberal use of F-marking in context, F-marking is limited by an economy measure (Avoid F) to just what is necessary to satisfy Givenness for any particular constituent.[14] The final elements of Schwarzschild's informal analysis are given in (30).[15]

(30) Definition of GIVEN (Schwarzschild 1999: 151):
    An utterance U counts as GIVEN iff it has a salient antecedent A and

   a.   if U is of type e, then A and U corefer;
   b.   otherwise, modulo ∃-type shifting, A entails the Existential F-Closure of U.

   GIVENness: If a constituent is not F-marked, it must be GIVEN
   AVOID F: F-mark as little as possible, without violating GIVENness

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[14] An alternative to minimizing F-marking is maximizing Givenness, as proposed in Truckenbrodt (1995). This option is pursued in different ways by Williams (1997) (DOAP—Don't overlook anaphoric possibilities), Büring (2012) (MaxAna—Maximize Anaphoricity), and Sauerland (2005), Wagner (2006), and Kučerová (2007) (Maximize Presupposition—Heim 1991).

[15] Schwarzschild's formal analysis uses designated assignment functions rather than Existential F-closure.

Consider the following illustrations of how this procedure allows for partly Given constituents.

(31)   A: Last week, John bought a blue convertible.
       B: Well yesterday, John bought a RED convertible.

(32)   A: Who did John's mother kiss? B: She kissed JOHN.

While *John bought a red convertible* is not GIVEN in (31B), the nominal, predicate, and sentential constituents are GIVEN if *red* is F-marked and the resulting constituents undergo Existential F-Closure (and ∃-type shifting as needed): the ensuing denotations for the noun phrase (∃*x* ∃*Y [x is a Y convertible]*), verb phrase (∃*x* ∃*Y [x bought a Y convertible]*), and sentence (∃*Y [John bought a Y convertible]*) are all entailed by the discourse prior *John bought a blue convertible*. It is also possible in (31) to consider the VP to be F-marked, since it is Given from A's statement that ∃*P[P (John)]*. But VP cannot be F-marked here: Avoid F rules out a representation in which both VP and *red* are F-marked, since F-marking just the latter suffices to satisfy GIVENness (30). (The VP alone cannot be F-marked since *red convertible* is not Given.) In (32B), though *John* is GIVEN, *kissed John* is not. *John* is thus F-marked despite being GIVEN, in service of satisfaction of GIVENness for the containing verb phrase and sentence which are otherwise not GIVEN.

   In this section, I will discuss three problematic aspects of this analysis. First, the analysis fails to capture focus sensitivity effects when all constituents in a specific domain are GIVEN (Beaver and Clark 2008). In fact, AVOID F rules out any possible F-marking in such cases. Second, Avoid F also proves overly restrictive in some cases where rhetorical relations play a role (Kehler 2005). Third, deaccenting of one constituent under Givenness often results in accenting some other constituent. Wagner (2006: 298) presents data that argue for a modification to Givenness such that '[m]arking a constituent *x* as given introduces the presupposition that there is an alternative *y′* to its sister *y*, such that the constituent [*y′ x*] is given'. Here Givenness of the deaccenting candidate does not suffice to license deaccenting; rather, deaccenting is dependent on the ability of the candidate's structural sister to express a focus of contrast.

3.3.1 Focus sensitivity

In Schwarzschild's system lack of F-marking is interpreted (by GIVENness), but F-marking has no particular interpretation. A constituent that is F-marked may be GIVEN or not. Nevertheless, if an F-marked constituent is GIVEN, it is F-marked in service of a higher prerogative only: the GIVENness of a containing constituent. While this consequence correctly characterizes many cases of contrastive focus, it fails in cases

where the GIVENness of a containing constituent is not at stake. Consider the following example from Beaver and Clark's (2008) discussion of this specific problem.

(33) {Brady taught semantics and . .}

    a. the students were glad that BRADY taught semantics.
    b. the students were glad that Brady taught SEMANTICS.
    c. the students were GLAD that Brady taught semantics.

Because the emotive predicate *glad* in (33) is a focus sensitive expression, the interpretations of these examples differ: (33a) expresses the students' preference for Brady, rather than someone else, to teach semantics, whereas (33b) expresses their preference for Brady to teach semantics rather than some other subject. But in Schwarzschild's system not only are each of the elements of the clausal complement to the predicate in both examples GIVEN, the clausal complement itself is GIVEN and hence grammatically unmarked and predicted to be deaccented, as in (33c). AVOID F rules out any further internal F-marking within these clausal complements, and so does not license F-marking of *Brady* in (33a) or *semantics* in (33b). But *Brady* and *semantics* are not deaccented though Given, and so must be F-marked in their respective sentences. Evidently, F-marking must distinguish between focus-as-alternatives (as in cases of focus sensitivity) and focus-as-new (in cases assessed by GIVENness directly). There are several revisions to Schwarzschild's analysis on offer: see especially Féry and Samek-Lodovici (2006), Krifka (2006), Kratzer and Selkirk (2007), Beaver and Clark (2008), Selkirk (2008), Beaver and Velleman (2011), Katz and Selkirk (2011). Most of these proposals elect to reserve F-marking for focus-as-alternatives, marking either Given or new constituents distinctly while adapting elements of Schwarzschild's analysis in (30).

    Other facts point to this same need to distinguish focus-as-alternatives and discourse new. Selkirk (2008) and Katz and Selkirk (2011) argue that when focused and new constituents co-occur in the domain of a focus sensitive operator (see Beck, this volume), an undifferentiated notion of focus does not suffice to distinguish the range of interpretations available. Consider the following example from Rochemont (2013b).

(34) {Did John do anything odd at the reception?} Yes—He only introduced BILL to SUE.

    a. … He didn't introduce anyone else to Sue.
    b. … He didn't introduce Bill to anyone else.
    c. … He didn't make any other introductions.
    d. … He didn't do anything else.

In the context indicated, the utterance *He only introduced Bill to Sue* is multiply ambiguous, as the possible continuations in (34) indicate: *only* may associate with just *Bill* (34a), with just *Sue* (34b), with both *Bill* and *Sue* (34c), or with the VP (34d).

But in Schwarzschild's analysis all of these constituents are F-marked (35), since none are GIVEN.

(35)   He only [introduced$_F$ Bill$_F$ to Sue$_F$]$_F$

(36)   a.   He only [introduced BILL$_F$ to SUE].
     b.   He only [introduced BILL to SUE$_F$].
     c.   He only [introduced BILL$_F$ to SUE$_F$].
     d.   He only [introduced BILL to SUE]$_F$.

Representation (35) does not distinguish among the various ambiguities evident in (34). On the other hand, if focused and new are distinguished by F-marking and new is unmarked, then the various interpretations in (34) can be represented distinctly as in (36), one representation corresponding to each of the interpretations invoked in (34a–d) respectively.

A similar argument presents itself from *it* cleft sentences, which are widely acknowledged to be syncategorematic focus sensitive contexts.[16] A cleft partitions a sentence into focus (the pivot) and background (suitably adjusted to replace the understood position of the focus within the cleft clause with a variable), as in (37).

(37)   It was [her sweater]$_{FOCUS}$ [that Mary lost __ on the cruise]$_{BACKGROUND}$

If focus bears the same relation to background as it does to Givenness, then the background in an *it* cleft must be Given. But while the background in an *it* cleft may be Given, and very often is, it need not be (for recent discussion, see Hedberg 2012).

(38)   A: I've been looking for Mary's sweater and can't find it anywhere.
     B: It was her sweater that Mary lost on the cruise.

For B's reply to be felicitous, the context set that precedes the utterance should include at least a shared proposition to the effect that Mary lost something on the cruise. Notwithstanding that this condition is satisfied (for instance, both speakers know that the fact that Mary lost something on the cruise is part of the context set), the cleft clause in sentence (38B) will be deaccented only in case the proposition that Mary lost something on the cruise is already Given in the conversational context, and not otherwise. Since this latter condition is not satisfied in the mini-discourse in (38), deaccenting of the cleft clause in (38B) is disfavoured, pending further amendment to the context.

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[16] A reviewer objects that the pivot of a cleft is not a focus except by assumption. The assumption seems warranted by the transparent alternative semantics of the pivot/background relation, and is rendered yet more plausible by the lack of existentiality and exhaustiveness implicatures in the clefts of some languages, where clefts serve solely a focus function (e.g. Zerbian 2006; Koch 2008).

Plainly, the cleft clause that marks the background in an *it*-cleft need not be Given for the cleft to be felicitous.[17] Accordingly, some distinction between background and Given is mandated—focus cannot be the complement to both background and Givenness.[18]

The need to distinguish focused and new extends also to prosody. Neeleman and Szendrői (2004) and Féry and Samek-Lodovici (2006) together give several arguments against F-marking as a focus-marking device in grammar, but what they implicitly argue is that for prosodic purposes discourse new and focus must be distinguished and F-marking, if used, must be restricted to focus (Selkirk 2008; Rochemont 2013b). In each case, the argument is based on showing that whenever new constituents compete with focused constituents for prosodic prominence, focus inevitably wins. These arguments are strongly supported by the experimental results reported in Katz and Selkirk (2011), who show that in sentences containing focus sensitive *only* and in which both new and focused constituents appear, focus prominence shows greater amplitude, duration, and intensity than new prominence, even in cases where a new constituent linearly follows a focused constituent.

A further prosodic argument (see Reich 2012) for the need to distinguish between focused and new stems from consideration of cases of Second Occurrence Focus (SOF—Baumann, this volume), illustrated in the following example adapted by Beaver et al. (2007) from Partee (1999).

(39)   A: Everyone already knew that Mary only eats VEGETABLES.
　　　　B: If even PAUL knew that Mary only eats <u>vegetables</u>, then he should have suggested a different RESTAURANT.

The pitch accented Focus *vegetables* in (39A) is Given with its containing clause in (39B), and it then comes as no surprise that this clause, including *vegetables*, is deaccented. What is surprising is that *vegetables* continues to function interpretively as a Focus in association with *only* even though it does not bear the expected pitch accent (as measured through f0 excursion in particular) that usually marks a Focus prosodically in English. Beaver et al. (2007) show that though it fails to show significant f0 excursion, the SOF *vegetables* in (39B) nevertheless continues to bear phrasal prominence as indicated by measures of intensity and duration. These results are interpreted to mean that focus in English is associated with some degree of prosodic prominence even when it is deaccented. It cannot then be the case that focus is simply the complement of Given if Givenness conditions deaccenting, since in SOF we see a variety of focus that is evidently deaccented.[19]

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[17]   This argument is particularly compelling in the case of Informative-Presuppositional clefts (Prince 1978), which may be used to initiate a discourse (e.g. as the lead sentence of a newspaper article) with virtually no part of the utterance Given.

　　(i)   It was just about fifty years ago that Henry Ford gave us the weekend.

[18]   Williams (1997) proposes nested topic/focus configurations to account for such cases, while still introducing a distinction between prosodically and structurally identified focus in clefts.

[19]   This argument presupposes that a Givenness-based account of SOF is possible, a position argued against in Büring (2015). See Beaver and Velleman (2011) for discussion.

3.3.2 Rhetorical effects

Schwarzschild (1999: 165) observes that Givenness marking through deaccenting is sensitive to rhetorical relations. In (40a) it is the Givenness of the matrix clause (*John borrowed the book*) that is central to the interpretation; in (40b) it is the givenness of the embedded clause (*Max purchased the book*).

(40) {John borrowed the book that Max had purchased.}

    a. No, MAX$_F$ borrowed it.
    b. No, Max BORROWED$_F$ it.

In either case, the relevant proposition (*x borrowed it, Max x'd it*) is GIVEN, and there is no problem with either GIVENness or AVOID F. But this is not always the case. Rhetorical effects are possible when GIVENness is satisfied but AVOID F is not.

Kehler (2005) compares Schwarzschild's (1999: 170) examples in (41) with the patently equivalent examples in (42) (although I have slightly modified the contexts): the accent pattern in (a) is preferred in (41) but infelicitous in (42), and that in (b) is preferred in (42) and is infelicitous in (41).[20]

(41) {John cited Mary, and you won't believe what he did next … }

    a. he DISSED$_F$ SUE$_F$.
    b. #he [dissed$_F$ SUE$_F$]$_F$.

(42) {Fred read the menu, and you won't believe what he did next … }

    a. #he ORDERED$_F$ a [HAMBURGER]$_F$.
    b. he [ordered$_F$ a HAMBURGER$_F$]$_F$.

Nevertheless in Schwarzschild's proposal,[21] only the F-markings and pronunciations in the (a) examples are predicted: AVOID F uniformly prohibits the F-marking and corresponding pronunciations of the (b) examples. Kehler explains that the contrast between

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[20] Rochemont (2013b) observes that (41b) is indeed felicitous if the accent pattern is understood to mark Contiguity rather than Resemblance. The option for both patterns is made clearer in the modified example in (i)

. (i) {John cited Mary. What did Bill do?}

    a. He dissed SUE.
    b. He DISSED SUE.

Many speakers agree that both responses are possible in (i), but the responses differ in that (b) marks a dual contrast between *cited/dissed* and *Mary/Sue*, whereas (a) marks only a contiguous event (see 43a).

[21] To guarantee a systematic relation between F-marking and accenting, Schwarzschild restricts required accents to privileged F-marked constituents, those that are FOC-marked under (i).

(i) FOC-marking: A FOC-marked node is a node that is not immediately dominated by another F-marked node.

(41) and (42) is due to a difference in rhetorical relations: the felicitous accent pattern in (41) reflects Contrast or Parallel (which are in the Resemblance category of coherence relations—see Culicover and Jackendoff 2012) while that in (42) reflects Contiguity. Despite the evident relevance of rhetorical relations to the choice of accent pattern in (41)/(42), the approach that Schwarzschild advocates for (40) will not extend to these cases without modification or elimination of AVOID F, as Kehler suggests.

A possible solution to this difficulty utilizes the revision proposed already in Section 3.1. If F-marking is restricted to focus-as-alternatives and discourse new constituents remain unmarked (one of several possible alternative revisions), then representations (41a)/(42a) remain unchanged, but (41b)/(42b) are revised to (43a,b).

(43)   a.   he [dissed SUE]$_F$
       b.   he [ordered a HAMBURGER]$_F$

Examples (41a)/(42a) mark the dual contrasting alternatives reading consistent with Contrast/Resemblance that is far more natural in the context of (41) than (42). The accent pattern and representations in (43), on the other hand, are consonant with the simple rhetorical Contiguity that is most natural to (42) in particular. The implicit question in the contexts of both (41) and (42) asks only what happened next—the differing felicity of patterns in the target utterances reflects the relative suitability of invoking rhetorical Contrast in (41) vs (42). Importantly, 'relative suitability' is at least partly a function of the speaker's rhetorical intent, the intentional use of accents to indicate either Contrast or Contiguity as the intended rhetorical relation.

3.3.3   Local alternatives

It has been commonly observed that deaccenting of one constituent under GIVENness often results in the accenting of some other constituent, the latter usually proposed to be a metrical or syntactic sister of the former (Ladd 1980, 2008; Culicover and Rochemont 1983; Selkirk 1984; Williams 1997, 2012; Wagner 2006, 2012a). In some cases, the shifted accent must mark a focus of contrast or deaccenting is barred, as in the following example from Wagner (2006).

(44)   {Mary's uncle, who produces high-end convertibles, is coming to her wedding. I wonder what he brought as a present.}

   a.   He brought [a CHEAP convertible].
   b.   # He brought [a RED convertible].
   c.   He brought [a red CONVERTIBLE].

Although *convertible* is GIVEN in (44a–c), it is only acceptably deaccented in (a). Wagner argues that what makes deaccenting possible in (a) but not (b) is that *cheap* in

(a) is an acceptable alternative to *high-end* as a focus of contrast, but *red* in (b) is not. GIVENness as formulated in (30) is not sufficient to capture this contrast between (44a,b) since in both cases *convertible* is equally GIVEN. Wagner argues for a reformulation of Givenness as Relative Givenness such that '[m]arking a constituent *x* as given introduces the presupposition that there is an alternative *y′* to its sister *y*, such that the constituent [*y′ x*] is given'. An observation that I think relevant here is that there is a further alternative in the context provided in (44). This is the continuation in (45).

(45) He brought [a cheap CONVERTIBLE].

Since the object is the locus of contrast in alternatives that are called for by the explicit question in (44) (*I wonder what he brought*), the object cannot be fully deaccented even if Given (cf. #*He BROUGHT a convertible*). Here we see again the relevance of rhetorical relations in speakers' use of deaccenting: if the speaker wishes to draw a contrast with high-end convertibles she may (44a), but need not (45). It nevertheless remains true, as Wagner claims, that deaccenting seems dependent in such cases on whether the deaccenting candidate's sister can plausibly mark a focus of contrast (Repp, this volume).[22]

Moreover, as Wagner observes, while in some cases the shifted accent must mark a focus of contrast (44); in others it seems it need not (46).[23]

(46) Mary, Sam, and John were sitting on the couch. Then Mary KISSED John.

Here the structural sister of the deaccented *John* does not mark a contextually licensed focus of contrast—although discourse new, *kissed* in (46) is not contrasted with other contextually given relations that hold between Mary and John. Wagner's (2006) solution is to posit LF raising of arguments, which allows the sister requirement on contrasting alternatives to be satisfied. Relative Givenness is satisfied after raising if the raised argument is Given and its sister, the residual sentence from which it is extracted, marks a weak contextually licensed contrast, 'weak' in the sense that any discourse prior proposition that contains the Given argument can count as a valid alternative.

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[22] Büring (2012) treats contrast in terms of the notion of *issue*: an issue is plausible if it partitions the worlds in the context set into complementary sets, each compatible with only one of the alternatives in the issue.

[23] Ladd (1980) proposes *default accent* to characterize the cases in which no contrastive interpretation ensues from deaccenting, although Godjevac (2006) and Rochemont (2013a) argue that the most widely cited putative example (*John doesn't READ books*) is not such a case. Still, other cases do not so readily succumb to such re-analysis, as with the following examples from Ladd's (1980) and Selkirk's (1984) discussions.

(i) I can't imagine what it would be like to be a dentist, but I'm awfully glad there are guys who want to BE dentists.
(ii) The buttermilk's the best part OF it.
(iii) I didn't even know it was BY Beethoven.

Wagner (2012a) modifies the Relative Givenness account of local alternatives to require local excluded alternatives (LEA), whereby the negation of the existential closure of the antecedent must be entailed by universal closure of the constituent under evaluation (akin to Schwarzschild's existential F-closure), effectively enforcing a partition of the set that unifies the two subsets so defined, such that one subset excludes the other. LF raising a Noun Phrase argument *a*, yields a proposition level constituent [*a b*] and givenness in such cases is determined by applying a two place exhaustive operator that requires there to be '… a salient constituent [*a′ b*] in the context such that the exhaustive operator applied to *a* and *b* excludes [*a′ b*]' (Wagner 2012a: 125). These proposals successfully cover (46) and related examples (such as those in footnote 23). They also provide a means to address the focus sensitivity data in (33) from Beaver and Clark (2008), through accommodation of a form consistent with our earlier proposals. Roughly, the deaccenting of *Brady* in (33a) gives rise to a requirement for a salient antecedent of the form $\exists x[x \text{ teaches semantics}]$ that is excluded by *Brady teaches semantics*. A similar account in terms of accommodation is possible for (33b). As Wagner observes, '… a context in which an alternative statement is excluded may well be the default type of context that is accommodated if one hears a sentence with marked prominence out of the blue' (Wagner 2012a: 126). Although these cases are not out of the blue, they do represent a choice among alternative presentations of the sentence in the context indicated. (Compare the third alternative (33c)). Notably, a speaker's choice of what to deaccent as Given relative to some accented alternative is not driven by context but must be compatible with context (as licensed by Givenness), as the contrast between (33a–c) makes clear.

In contrast to Schwarzschild's analysis, Wagner's LEA proposal introduces alternatives into the calculation of Givenness, so that both Focus-as-new and Focus-as-alternatives might be seen to complement Givenness. It remains unclear whether such a programme can succeed and so eliminate reference to Focus completely. Problems remain that have no clear solution, including how to provide for evidence of a prosodic contrast between New and Focused and how to capture SOF.[24] In the absence of a proposal on these issues, Focus and Givenness do not yet appear wholly susceptible to unified analysis.

3.4 CONCLUSION

This chapter has explored Givenness as expressed through Givenness marking in English in the form of deaccenting. It has been argued that the data support a coreference/entailment based approach to Givenness, in contrast to other conceivable

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[24] See Stevens (2014) who argues specifically against both the LEA analysis and the LF raising of arguments.

formulations. Moreover, Givenness is expressible as a form of presupposition so long as a distinction is drawn between two distinct types of beliefs in Common Ground (beliefs about the subject matter of a conversation and beliefs about the conversation itself (Stalnaker 2002)) or between two distinct components of CG, CG Content, and CG Management (Krifka 2008). This view gives rise to a novel account of some long-standing problems stemming from the lack of accenting in English all-new utterances.

In evaluating the influential proposal of Schwarzschild (1999), we have also seen that Givenness presents necessary though not always sufficient contextual conditions on deaccenting—speakers deaccent in accord with their communicative intents in regard at least to evoking focus alternatives and expressing rhetorical relations, not because the context strictly speaking requires them to. Apparent mandatory deaccenting, when it arises, is best seen from this perspective in the following way: failure to deaccent when to do so would be consistent with a speaker's actual communicative intent misleads interlocutors to think the speaker must have some other intent: deaccenting is mandatory when it is unavoidably consistent with a specific rhetorical intent. With regard to the question of how focus and givenness are related, it was argued that while Givenness (specifically under Wagner's 2012a formulation) comes close to eliminating Focus, it does not do so completely. Some evidence still supports a three-way contrast between Given, focused, and new.[25]

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[25] Due to reasons of space, I have not explored in this chapter either range of variation in prosodic marking of Givenness (for relevant discussion see Zubizarreta 1998, this volume; Cruttenden 2006; Zerbian 2012) or the syntactic expression of Givenness (see Grosz, this volume; Fanselow, this volume; López, this volume; Neeleman and van de Koot, this volume; Winkler, this volume).

CHAPTER 4

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(CONTRASTIVE) TOPIC

....

DANIEL BÜRING

4.1 CONTRASTIVE TOPICS: THE UN-FOCUS

To approach contrastive topics, we take focus as our point of departure (non-contrastive or thematic topics will not be discussed until Section 4.5 below).[1] A focus-marked (F-marked) constituent, roughly, is interpreted as 'the new information in response to a question':[2]

(1) (Who did they kick out? —) They kicked ME out.

Either because of the meaning of focus, or because of the pragmatics of question–answer pairs, focus is interpreted exhaustively ('⇝' marks a pragmatic inference):

(1) ⇝ it was me they kicked out; no-one else was kicked out

This sometimes carries over to sentences with two intonational prominences:

(2) (Did you kick her out? —) SHE kicked ME out!
      ⇝ it was her who did the kicking out, and it was me who got kicked out; no one else kicked anyone out

It seems therefore plausible to analyse (2) as a double focus:

(3) (Did you kick her out? —) SHE_F kicked ME_F out!

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[2] Small caps indicate intonational prominence; sentences in parentheses are given as context and not annotated for intonation.

In some instance (or some contexts), however, the two prosodically highlighted elements are interpreted asymmetrically:

(4) (Who do they want to kick out? —) SHE wants to kick ME out.

    a. NOT: it is her who wants to do some kicking out, and it's me who (she hopes) is going to get kicked out; no one else wants to kick anyone out

    b. BUT: as far as she is concerned, it's me that should get kicked out; she does not want to kick out anybody else

The answer in (4) suggests a continuation along the lines of '… whereas someone else wants to kick so-and-so out'. In that case, *she* is—by assumption—marked as a contrastive topic (henceforth CT), rather than a focus:

(5) (Who do they want to kick out? —) SHE$_{CT}$ wants to kick ME$_F$ out.

Like focus, a CT relates to alternatives ('someone else'), but whereas with the double focus in (2) all combinations of alternatives are, pragmatically, excluded ('no one else kicked anyone out'), with the CT+F in (5), the exclusion only concerns who she wants to kick out (see Rooth, this volume, for more on alternatives). It is in fact implied that *others* want to do some kicking out as well.

The notion that CT marking results in a set of alternative propositions which are explicitly *not* used for exhaustification lies at the heart of the recent proposals in Hara and van Rooij (2007), van Rooij (2010), and Tomioka (2009, 2010). In fact, at least Tomioka (2009, 2010) does not explicitly state anything more about what is done with these alternatives. The idea is that from the mere existence of such non-excluded alternatives, a hearer can deduce that the speaker must find these alternatives potentially relevant, and at least possible (otherwise she would have explicitly excluded them, i.e. have used a focus instead).

This may ultimately be the most elegant account of CT, but for the time being we will outline an account here which specifies the reasoning that leads from the presence of non-excluded alternatives to their actual pragmatic effects in more detail, as part of the linguistic rule system.

In Büring (2003) I argued for the following view: Whereas F relates a declarative sentence to alternative propositions, CT+F relates it to alternative questions. In (4), the alternative propositions say things like 'she wants to kick George out', 'she wants to kick Marcy out', etc., whereas the alternative questions are 'Who does Bob want to kick out?', 'Who does Kim want to kick out?', etc. (I use single quotes to characterize meanings). The alternative propositions are alternative answers to the question, so by the pragmatics of questions, and following the line of analysis just quoted, they are excluded: she doesn't want to kick George/Marcy…. out, only the speaker. The alternative questions, on the other hand, are not excluded in any way; rather at least one must be pertinent to the conversation. This is the case in (4): The original question was who they want to

kick out. Given that the answer is limited to *her* intentions, there must be other relevant people—the other members of the group referred to by *they*—for whom it is pertinent to ask: Who does *(s)he* want to kick out?

This basic idea can be implemented via an extension of alternative semantics for focus (von Stechow 1981; Rooth 1985, this volume), which derives from a sentence like (4), repeated with information structural marking in (6), the set of F-alternatives, (6a), as well as the set of CT-alternatives, (6b):[3]

(6) SHE$_{CT}$ wants to kick ME$_F$ out.

   a. F-ALTERNATIVES: the set of propositions like 'she wants to kick *x* out', for some individual *x*
   b. CT-ALTERNATIVES: the set of question meanings like 'Who does *y* want to kick out?', for some individual *y*

We will write S^{CT+F} for a sentence containing CT+F (analogously for F+F, F etc.), and $[\![S^{CT+F}]\!]_O$, $[\![S^{CT+F}]\!]_F$, and $[\![S^{CT+F}]\!]_{CT}$ for its ordinary meaning, F-, and CT-alternatives, respectively.

What to do with the CT-alternatives? That is, how are they *interpreted*? For the purpose of this paper, (7) will serve as our sole rule:

(7) CT-INTERPRETATION RULE (CIR)

   For a sentence S^{CT+F} to be felicitous, there must be at least one question meaning in S^{CT+F}'s CT-value which is

   a. currently pertinent, and   PERTINENCE
   b. logically independent of $[\![S^{CT+F}]\!]_O$, and   INDEPENDENCE
   c. identifiable.   IDENTIFIABILITY

The requirements on S^{CT+F} introduced by the CIR should be understood as conventional implicature triggered by the presence of CT marking. Applied to (6), (7) requires that speaker and hearer can identify at least one question instantiating 'Who does *y* want to kick out?' which is pertinent and independent of (6) itself. We will elaborate on what exactly is meant by Pertinence, Independence, and Identifiability in the course of this chapter, but it should be clear already that in a context in which it was asked who *X* want to kick out, *X* some group, there are at least as many such pertinent questions as there are members of *X*. If one knows who the members of *X* are, one can identify the questions about them. And only one of those questions is resolved by—i.e. not independent of—the answer *She wants to kick me out* (namely 'Who does she want to kick out?'); the other questions ('Who does Jeanne want to kick out?'…) are independent of that answer, meeting (7).
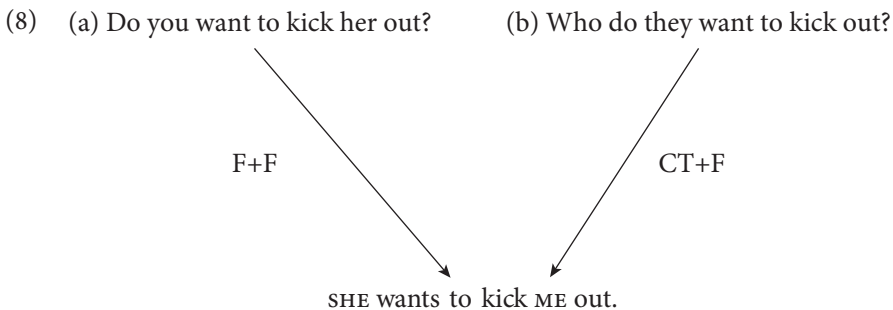
Note that (7) is *not* met in (2) *(Did you kick her out?—*SHE *kicked* ME *out!)*. If *she* were a CT (and *me* a focus), (7) would require that there is at least one question like

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[3] See Büring (2003: sec. 12.1) for how to do that, Büring (1997b: sec. 3.3) for details.

'Who did *y* kick out?' which is pertinent to the conversation *and logically independent of (i.e. not resolved by) the answer*. But this is not the case: What we are interested in is whether he kicked her out, or she him. Answering that she kicked him out resolves this issue completely, in violation of the CIR in (7), in particular Independence, (7b).

Crucially, failure to meet (7) does not mean that (2) is infelicitous, only that it cannot be a CT+F structure. As stated above, it does have a well-formed structure on which both *she* and *me* are F, to which (7) simply does not apply.

A question not addressed so far is whether the F+F structure in (2) is prosodically different from the CT+F structure in (4). Or, put differently, whether prosody can disambiguate the declarative sentence in (8) between a double focus (answering (8a)) and a CT+F structure (answering (8b)):

(8)   (a) Do you want to kick her out?   (b) Who do they want to kick out?

                F+F   CT+F

                        SHE wants to kick ME out.

This question has not been systematically investigated, but it is usually assumed that the two intonational contours resulting from the different questions in (8) are, or at least can be, different. Impressionistically speaking, the F+F contour has a high pitch accent on the first F *she*, followed by a low stretch (presumably H* L– in Mainstream American English ToBI notation, cf. Beckman et al. 2005) and another high pitch accent on *me*, followed by a low boundary (H* L–L%).[4]

The CT+F contour, in contrast, has a rising pitch accent on *she*, after which the pitch remains rising/high (L*+H), followed again by a high pitch accent on *me*, and a low boundary (H* L–L%). In a very stylized form, the CT on *she* would be realized as a 'rise–fall–rise' (L*+H L–L%)—what Jackendoff (1972) calls a B-accent—whereas the F-accent would just be a high pitch accent, followed by a low tone (H* L–).

In what follows I will assume that CT+F sentences are indeed prosodically different from F+F sentences. There are other ways to tease the two patterns apart. In a CT+F sentence, CT may be fronted across F, as in (9b):[5]

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[4] See Eady et al. (1986), experiment 2, for comparison of this accent pattern with wide and narrow foci—though not with what we call CT+F here. Mehlhorn (2001) and Braun (2005) compare CT+F in German to 'neutral' sentences, but not systematically to what we call F+F here.

[5] Sub-examples with letters are to be read as *alternative* continuations, so (9b) is not a reply or sequel to (9a), but—like (9a)—to (9).

(9) (Churchmoth recorded this song in eighty-three.)

    a. And MUCKENSTURM recorded it in SEVENTY-TWO.
    b. And in SEVENTY-TWO, MUCKENSTURM recorded it.

An F+F sentence does not allow for non-canonical ordering of the two F, cf. (10):

(10) (Churchmoth wrote this song in eighty-three.)

    a. No, MUCKENSTURM wrote it in SEVENTY-TWO.
    b. #No, in SEVENTY-TWO, MUCKENSTURM wrote it.

For pragmatic reasons, the answer in (10)—unlike that in (9)—must be an F+F sentence: If Muckensturm wrote the song in 1972, there cannot be other pertinent questions like 'When did Batiston write it?' (or 'Who wrote it in 1982?'), given that songs are only written once. Accordingly, (10b), which involves preposing of one focus across the other, is out. We can thus take the possibility of non-canonical order of two prosodically prominent constituents to be indicative of a CT+F pattern.

I will now review some of the uses that have been taken to be typical for CT+F patterns in the literature.

4.2 CT PHENOMENOLOGY

4.2.1 Partial topics

Answers to multiple *wh*-questions, or a single *wh*-question containing plurals, typically allow CT+F answers:

(11) a. (Which guest brought what? —) FRED$_{CT}$ brought the BEANS$_F$.
    b. (Where do your siblings live? —) My SISTER$_{CT}$ lives in STOCKHOLM$_F$.

The CT values of the answers in (11) are 'What did x bring?' and 'Where does your x-sibling live?', respectively. Given the more general questions about the guests/siblings, we can see how the CIR in (7) is met: The questions in $[\![(11a/b)]\!]_{CT}$ are obviously pertinent, and independent of the answers in (11).

Languages with topic-marking morphemes like Korean *-nun* or Japanese *wa* likewise use these markers, together with intonational prominence, in such discourses:[6]

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[6] Lee (1999); for Japanese see Uechi (1998), Tomioka, this volume.

(12) (Who did what? —)

[JOE-**nun**]$_{CT}$ ca -ko SUE- **nun** nol- assta.   (Korean)
Joe CT   *sleep* *and* *Sue* CT   *play* PAST

The question need not be overt in order for CTs to occur. Simple pair-lists that answer an obvious implicit question like 'Who ate how many mbeju?' suffice, as the following example from Guaraní shows:[7]

(13) (Sambo's father ate 35 mbeju (mandioka starch patties), his mother ate 20…)

… ha   Sámbo=katur   ho'u 54 mbeju   (Guaraní)
and *Sambo*-CONTRAST *eat 54* *mbeju*

It is not necessary that the speaker knows what the answer to the other question is. The following example from Hungarian is representative for contexts showing that:[8]

(14) (Ki   aludt   a   padlón? —)   (Hungarian)
who *slept* *the*   *floor*

'Who slept on the floor?

[A PADLÓN]$_{CT}$ PÉTER$_F$ aludt, és   (lehet, hogy) sehol
the floor-SUP   *Peter*   *slept* *and perhaps that*   *nowhere*

máshol   nem is aludt senki más.
other place not   *too slept* *nobody different*

'It was Peter who slept on the floor, but (it is possible that) nobody slept anywhere else.

Example (14) is instructive in two respects: First, the speaker need not believe that someone else slept in a *different* place (see also Section 4.3 below); and second, (s)he does not even have to think that the other question does in fact *have* a well-defined answer, as long as the question itself ('where did the others sleep') is pertinent. This shows that it is accurate for the CIR to refer to alternative questions, rather than their answers.

4.2.2 Shifting topics

(15) a. (Will Bo come to school today? —) YESTERDAY$_{CT}$ he was SICK$_F$.
      b. (Where did Fritz buy this book? —) BERTIE$_{CT}$ bought it at HARTLIEB$_F$'s.

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[7] Krivoshein De Canese et al. (2005: 81), via Tonhauser (2012: 273); the marker *katur* is glossed 'contrast'. It can occur in non-initial answers within a CT+F answer sequence.
[8] Gyuris (2002: 38f), see also É. Kiss, this volume.

The CT-questions here are 'How is/was Bo on day x?' and 'Where did x buy this book?'. Which of them are pertinent? For (15b), the very questions overtly asked is pertinent and not resolved by the answers. Similarly, for (15a) the question how Bo is today is pertinent, since its answer will indicate whether he will come to school today. (Note that we do not aim to answer the question why the answers in (15) are *relevant* to the question in particular, but only why they can bear the CT+F pattern they do.)

4.2.3 Purely implicational topics

(16) (Where was the gardener at the time of the murder? —) The GARDENER$_{CT}$ was in the HOUSE$_F$.

In this case, the answer directly resolves the question that was asked. But the CT indicates additional questions: Where was the chauffeur? The cook?[9] Are they pertinent? Quite plausibly 'yes' in a case like (16), where the questioner is easily construed as trying to find the murderer. This is not always the case, of course:

(17) (Where did Thomas Mann write *The Beloved Returns*? —)
      # MANN$_{CT}$ wrote it in [LOS ANGELES]$_F$.

The odd implication of the CT-marking on *Mann* is that someone else might have written the novel elsewhere, which defies word knowledge (similarly to (10b) above).
    Somewhat in-between are cases like (18):

(18) (Do you remember where you were when you first heard about Chernobyl? —)
      I$_{CT}$ was at HOME$_F$.

Using the CT-marking on the first person subject here adds the implication that someone else's whereabouts (at the time of their learning about Chernobyl) are a pertinent question. Unlike in the murder case (17), this is not so easily accommodated here, but unlike in the Thomas Mann case, one can probably come up with something that the speaker considers pertinent, maybe that her dog was vacationing in the Ukraine.
    Even in (16), though, there is a feeling that the speaker stretches the use of CT, flouting the CIR, which govern its use. Why? Recall from (7) that the CIR requires that the pertinent questions referenced by CT should be *identifiable*—(7c). This amounts to knowing at least some value for x in 'Where was x at the time of the murder?' which makes for a pertinent question (see Section 4.4 below for more). While, for example,

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[9] Though of course, the gardener did it!

with partial topics (Section 4.2.1 above) the question itself names a group containing such x (so Identifiablity is met), additional common knowledge between the speaker and addressee about who the suspects are is needed in (16); and the more unclear the group of potential xs is, the more enigmatic the answer appears, as in (18) (where additionally, Pertinence is a problem).

Examples (16) and (18) show that CT-marking does not necessarily just 'echo' something that is in the context already, but may itself contribute, possibly by way of accommodation, the notion that more questions are pertinent at this point. Conversely, the CT marking on for example, *the gardener* in (16) can be omitted without loss of coherence. But without it, there is no implication of other suspects (via other questions). So here the speaker is making a choice as to whether to indicate the presence of other questions prosodically or not.

4.2.4 Ineffability

In some cases, CT marking appears impossible, regardless of context. One such case from German is (19) (Büring 2003: 534):

(19)   #ALLE$_{CT}$ Politiker   SIND$_F$ korrupt.   (German)
      all   *politicians* *are*   *corrupt*

Without CT-marking (but retaining F on the finite verb), (19) would be perfectly well-formed. But CT-marking on the determiner *alle* leads to unacceptability (even though *alle* can be CT-marked under other circumstances, as we will see momentarily). Why is that?

Assuming that F on a finite verb signals polarity focus, the F-alternatives of (19) are that all politicians are corrupt, or that they are not. This means that the CT-alternatives are questions like 'Are Q politicians corrupt?', where Q is some determiner.

Now note that none of these questions are independent of (19)'s assertion: If all politicians are corrupt, that logically entails the answers to 'Are most/some/the… politicians corrupt?', namely: 'Yes'. In other words, independently of actual context, (19) cannot possibly meet the CT-Interpretation Rule (7), specifically Independence, (7b), and hence is ungrammatical (or 'unpragmatical', if you like).

If we change the example slightly, CT+F is possible again:

(20) a. EINIGE$_{CT}$ Politiker   SIND$_F$ korrupt.   (German)
        some   *politicians* *are*   *corrupt*

     b. ALLE$_{CT}$ Politiker   sind   ETWAS$_F$ korrupt.
        all   *politicians* *are* *a little*   *corrupt*

The CT-alternatives of (20a) are the same as in (19), but since the sentence itself neither entails nor precludes that all, or most, politicians are corrupt, these will be unresolved (and potentially pertinent) questions. In (20b), with the added degree expression, CT-alternatives are 'How corrupt are Q Politicians?', that is, questions that could be answered by *Only a handful are totally corrupt* or *Some are not at all corrupt*. And while the latter is again resolved by (20b)'s assertion, the former, for example, is not. There are thus unresolved (and potentially pertinent) questions among the CT-alternatives, as required by CIR.

4.2.5 Scope inversion

If a S^{CT+F} is structurally ambiguous between a construal on which it violates the CIR—along the lines just discussed in Section 4.2.4—and one on which it does not, CT marking will effectively disambiguate the sentence towards the latter. A case in point is sentence (21), with CT+F marking as indicated, which can only mean that not all politicians are corrupt. Without CT marking, it can either mean that, or that all politicians are non-corrupt:[10]

(21) ALLE$_{CT}$ Politiker sind NICHT$_F$ korrupt.   (German)
      all   politicians are   not   corrupt

  'Not all politicians are corrupt.'

The same can be observed for example in Hungarian (from Gyuris 2002: 80): (22) only has the 'not… everybody' reading, although quantificational elements in Hungarian usually have a preference for surface scope:

(22) MINDENKI$_{CT}$ NEM$_F$ ment el.   (Hungarian)
      everybody   not   went PREFIX

  'It is not the case that everybody left.'

Let us focus on the available construal first: The sentence asserts that not all politicians are corrupt, and its CT-alternatives will be 'Is it false that Q politicians are corrupt?', for example 'Is it false that many politicians are corrupt?'. This question is not resolved by the assertion, and it is plausibly pertinent, meeting the CIR.

   On the other construal, the sentence says that all politicians are un-corrupt, with CT-alternatives like 'Are Q politicians corrupt?'. But since the sentence asserts that none of them are, any such question is resolved by the assertion alone. As was the case with (19), this construal of (21) cannot possibly meet the CT Interpretation Rule (7). But in (21), unlike in (19), there is a second construal which *is* (or can be) felicitous, so that the sentence is acceptable, though not ambiguous, with CT+F marking. A similar effect can be observed in (23):

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[10] From Jacobs (1984), analysis following Büring (1997a).

(23) Ich habe NICHT_{CT} getrunken, weil   ich TRAURIG_F bin. (German)
   I   have   not   drunk   because I   sad   am

   'I didn't drink because I'm sad.'

With the CT+F marking as indicated, the sentence invites the question 'Then why DID you drink?'. For that to make sense, the sentence itself must be interpreted as 'it is not the case that my being sad is the reason for my drinking'. If it meant 'my sadness is the reason I don't drink' it would be incoherent to ask what, instead, is the reason the speaker drinks. Without this CT+F marking, on the other hand, that latter reading is easily possible. So here, just as in (22), the CIR disambiguates by way of rendering one logical construal of the sentence contradictory.

4.3 Single CT and F+CT

English has a rise–fall–rise (RFR) pattern—L*+H L– H% in MaeToBI notation—which can occur sentence finally, that is, without a following F:[11]

   (24) a. (Will Uncle Michael and Aunt Carolyn be coming to the rehearsal dinner? —)
         They're INVITED_{RFR}.
       b. (What about the beans? Who ate them? —) FRED_F ate [the BEANS]_{RFR}.

For both the 'sole RFR' and the 'F+RFR' we should ask whether the RFR is the same as CT in CT+F. The parallels are striking, not just prosodically, but pragmatically. For example RFR on *all* in (25) disambiguates the otherwise scope ambiguous string towards the 'not all' reading, much like CT+F on *alle… nicht* ('all…. not') did in (21) above:[12]

   (25) ALL_{RF} the men didn't go_R.

Likewise, Japanese stressed *wa*, and Korean stressed *nun*, the pragmatics of which appear very similar to English and German CT marking, can appear without an accompanying focus, yielding scope disambiguation:[13]

   (26) MOTU -NUN O   -ci   anh -ass -ta   (Korean)
      all   CT   come CONN   not PAST DEC

   'Not all of them came.'

[11] See, among others, Ward and Hirschberg (1985); Pierrehumbert and Steele (1987); Hirschberg and Ward (1991); examples from Bolinger (1982: 507) and Jackendoff (1972: 261).
   [12] From Ladd (1980: 146). I notate the final R at the end of sentence here, indicating that it is not part of the pitch accent on the prominent word—*all* in (50)—but a rise at the right edge of the intonational phrase.
   [13] Lee (1999); see Hara (2008), Oshima (2008) and Tomioka (2009, this volume) for Japanese.

Furthermore, RFR may occur in partial answers and shifting topics, similar to the cases discussed in Sections 4.2.1 and 4.2.2 above:[14]

(27)   a.   (Can Jack and Bill come to tea? —) BILL$_{RF}$ can$_R$.
       b.   (Did you feed the animals? —) I fed the CAT$_{RFR}$.
       c.   (Do you want a glass of water? —) I'll have a beer$_{RFR}$.

Constant (2006, 2012) assumes that the accent in RFR is a focus, and that RFR operates on the focus alternatives, conventionally implicating (28):

(28)   a.   There are contextually salient focus alternatives to S^{RFR}, which are informative (i.e. neither contradictory nor redundant after the utterance of S^{RFR}),[15] and
       b.   for all such alternatives *a*, the speaker cannot 'safely claim' *a*. (cf. Constant 2012: 408, 414, 424)

Example (28a) states that there are alternatives in the focus value which are independent of the assertion of S^{RFR} (as well as the Common Ground). It should be transparent that that derives the scope disambiguation effects, as well as cases of wholesale infelicity in case the assertion of S^{RFR} entails or contradicts all its alternatives:

(29)   a.   ALL$_{RF}$ my friends didn't come$_R$.

            no alternatives '*n* of my friends did not come' open, but open alternatives 'not *n* of my friends did come'; compare (21)

       b.   # ALL$_{RF}$ of my friends liked it$_R$.[16]

            no open alternatives '*n* of my friends liked it' at all; compare (19)

It should be noted that (29b) (as well as (19)—all *politicians* ARE *corrupt*) has F-alternatives which are entailed ('some/most of my friends liked it'), as well as ones that are contradictory ('none/fewer than half of my friends liked it'). This is captured by the word 'informative' in (28a), as well as the word 'independent' in the CIR, (7b). Weaker conditions which merely require alternatives that are compatible (but possibly redundant, such as Wagner 2012: 24, ex (46)), or non-redundant (but possibly known to be false, such as Oshima 2008: 7, ex (17)), or simply not equivalent to S^{RFR} (e.g. Ludwig 2008: 391, ex (19)) will systematically fail to derive the desired result.

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[14] O' Connor and Arnold (1973: 173), Ladd (1980: 153), examples (16) and (19).
[15] This half of the rule is also assumed in Wagner (2012: 24), where it is assumed that any additional meaning of RFR follows by Gricean reasoning, instead of being grammatically encoded.
[16] Constant (2012, ex (33b)).

Turning to the examples in (27), here, too, (28a) is crucial, in particular the 'salient' bit: In (27b), repeated below, as well as (30b), we are looking for alternatives like 'I fed x' which are informative; this holds for any alternative $x \neq$ 'the cat'. Assuming that the speaker fed the cat only, none of these is 'safely claimable', either, so (28) appears to be met in both (30a) and (30b):

(30) a. (Did you feed the animals? —) I fed the CAT$_{RFR}$.
     b. (Did you feed the cat? —) # I fed the CAT$_{RFR}$.

Crucially, then, such alternatives must be salient in (30a), precisely because the question *asks* about them (namely whatever other animals are in $[\![$the animals$]\!]_O$; the anomaly of (30b), on the other hand, must arise because the question only makes one proposition salient: 'I fed the cat'. Since that proposition is entailed by the answer, (28a) is violated, not because there are no informative unclaimable F-alternatives, but because none of them qualifies as 'salient' in the context of (30b). Similarly in (27a) and (27c).

The alert reader will notice that 'salient' in (28) plays much the same role as 'pertinent' in (7a) in the CIR. Unsurprisingly, then, cases like (25)–(27c) can be analysed using the CIR as well, if we replace the informative and non-claimable *proposition* required in (28) by the yes/no-question based on it, that is, 'Did not n of my friends come?', 'Can x come to tea?', 'Did you feed x?', and 'Will you have an x?'. This was suggested in Büring (2003: 532), where it was assumed that the CT-value of a declarative with CT but without F is a set of yes/no-question meanings (see Constant 2012, sec. 5.3 for more discussion).[17]

4.4 DETAILS, OPEN QUESTIONS, AND ALTERNATIVES

4.4.1 Last answer

Crucial to the treatment of scope disambiguation in Section 2.5 was the fact that an S^{CT+F} must not be a *complete* answer to the questions in its CT-value, that is, that the latter contain at least one independent question. It bears pointing out that, according to the CIR in (7), there need not be an actual open question (in $[\![S^{CT+F}]\!]_{CT}$) *after* uttering

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[17] Strikingly, parallel German cases appear to have a focus on the finite verb or negation, as in (21) above, which—by standard F semantics—yields the meaning of a yes/no-question as the focus value. Generally, German does not allow for CT (or RFR) without a following F, so one can hypothesize that German here chooses an F-marking—on the finite verb—which yields the same result that a CT-only/RFR sentence would (see Büring 2003: 532).