Causative Alternation Licensing in Urdu:

An Event Structure Account

Ahmad Naveed Sharif

A thesis in fulfilment of the degree of
Doctor of Philosophy in Linguistics
at the University of Otago, Dunedin
New Zealand
2020

for

əmmi-əbba

Abstract

Given the central role of the verb in clause structure, it is vital to understand the properties of the SEMANTIC ROOT and the EVENT SCHEMA, two constituent aspects of verb meaning, in order to understand how lexical semantic categories relate to syntactic categories. The nature of the interface between these components can, in turn, reveal the overall design of language. However, the main challenge is to make precise the nature of the semantic root and event schema, and their interactive role in argument realization options. To address this challenge, empirical evidence from diverse languages is required to determine how argument realization can be universally accounted for in terms of semantic root and event schema-based lexical semantic representation. The primary purpose of this study is to explicate the roles of semantic root and event schema in Urdu change-of-state (COS) verbs' causative alternation, formulating licensing conditions on the lexical semantics-syntax interface involved in the phenomenon. On the semantic side of the interface, the argumentation is framed within Rappaport-Hovav and Levin's (1998a) event structure account, and on the syntactic side, the study assumes Culicover and Jackendoff's (2005) Simpler Syntax which accounts for an alternation in terms of constraint-based interface principles.

Given that the adequacy of theory is bound up with the reliability of empirical evidence, this study is based on data from multiple sources (lexical translation, Urdu WordNet, Urdu Lughat, individual and dialogical introspection, and speaker survey), conducts extensive analysis of morphosemantic as well as morphosyntactic aspects of 112 Urdu COS verbs, and shows that the causative alternation results from an interaction of multiple licensing factors.

The study reaches the following conclusions: (a) The anticausative form of a COS verb is basic and causative forms are derived. (b) The causative derivation shows gradient and dynamic

productivity, and an interaction between lexical schemas and morphological operations, marking the CAUSE relation which reflects causal responsibility between the event participants. (c) An anticausative lexicalizes both manner and result, with a [BECOME$_{<MANNER>}$ [Y <*STATE*>]] event structure. (d) An anticausative's event schema and root license only the patient argument; any additional argument is licensed by the root. The cause arguments in causatives are introduced by causative operations, and are obligatorily event schema participants. The syntactic realization of semantic arguments is sensitive to the causal responsibility relation which is reflected in the predicate's event structure through the primitive predicate CAUSE and its relation with ACT and BECOME. (e) The various aspects of Urdu COS verbs' causative alternation lead us to the linking rules which show that the argument structure reflects the semantics it inherits from its semantic sources of roots and event schema.

Overall the study shows that the event structure account of Urdu COS verbs' causative alternation supports the decomposition of the grammar into independent generative components that interact through interface rules. The bottom line is that such a syntax-semantics interface formulation of alternation avoids syntactic complexity.

Acknowledgements

I have been reading on argument realization for several years, so I owe a debt of gratitude to people too numerous to mention. Levin and Rappaport-Hovav's "Argument Realization" introduced me to this phenomenon, and Jackendoff's "Foundations of Language" and Culicover and Jackendoff's "Simpler Syntax" helped me extend the horizon of my overall understanding of language. These works, among others, have helped me on my way in exploring this subject. In the course of researching CAUSE, I greatly benefited from Kistler's "Causation and Laws of Nature", and Mumford and Anjum's "Getting Causes from Powers". Evans's "How Words Mean: Lexical Concepts, Cognitive Models, and Meaning Construction" introduced me to the distinction between semantic and conceptual structures. I am also grateful to my informants for being cooperative and patient.

I would like to record my thanks to late Professor Jae Jung Song for supporting a University of Otago Doctoral Scholarship, which enabled me to research the project in 2017–2020. To the members of my supervisory committee, Dr. Hunter Hatfield, Dr. Simon Overall and Professor Malka Rappaport-Hovav, I am indebted for their critical comments, encouragement and kindness. Of course, all errors and misinterpretations must remain my sole responsibility.

Lastly, I would like to thank my mother and father for developing in me a life-long taste for learning, my brothers and sisters for their support, my wife Khazima for her assistance, and our three children, Raaid, Izza, and Aisha, for the necessary interruptions and distractions.

Transcription Scheme[1]

Urdu Consonants

Orthographic	Phonetic (IPA)	Transcription
ب	b	b
پ	p	p
ت	t̪	t
ٹ	ʈ	ṭ
ث	θ	s
ج	ʤ	j
چ	ʧ	c
ح	ɦ	h
خ	x	x
د	d̪	d
ڈ	ɖ	ḍ
ذ	ð	z
ر	r	r
ڑ	ɽ	ṛ
ز	z	z
ژ	ʒ	y
س	s	s
ش	ʃ	ʃ
ص	sˤ	s
ض	dˤ	z
ط	tˤ	t
ظ	ðˤ	z

[1] Adapted from Raza (2011).

ع	ʕ	ɘ
غ	ɣ	ɣ
ف	f	f
ق	q	q
ک	k	k
گ	g	g
ل	l	l
م	m	m
ن	n	n
و	ʊ	v
ہ	h	h
ی	j	y
ھ-(Aspiration)	ˍh	ˍh

Urdu Vowels

اَ	ə	ə
اِ	ɪ	ɪ
اُ	ʊ	ʊ
ا	a:	a
اے	e	e
اَے	æ	ɛ
اِی	i:	i
او	o	o
اَو	ɔ	ɔ
اُو	u:	u
ں	~	~

Glossing Abbreviations

1	First Person
2	Second Person
3	Third Person
ABL	Ablative
ACC	Accusative
CPM	Conjunctive Participle Marker
DAT	Dative
$CAUS^{d}$	Direct Causative
$CAUS^{ind}$	Indirect Causative
ERG	Ergative
F	Feminine
GEN	Genitive
IMPF	Imperfective
INF	Infinitive
INST	Instrument
LOC	Locative
M	Masculine
NOM	Nominative
NFN	Non-finite
OBL	Oblique
PASV	Passive
PST	Past
PRF	Perfect
PL	Plural
PRS	Present
SG	Singular

Table of Contents

Abstract i

Acknowledgements iii

Transcription Scheme iv

Glossing Abbreviations vi

1. Introduction 1

1.1 Background of the Study 1

1.2 Research Problem 4

1.3 Theoretical Assumptions 6

1.4 Research Design 8

1.5 Basic Clause Structure in Urdu 9

1.6 Outline of theThesis 14

2. Literature Review 17

2.1 Lexical Semantic Representation of Verbs 17

2.1.1 Semantic Role Approach 18

2.1.2 Event Structure Approach 22

2.1.2.1 Localist Approach 23

2.1.2.2 Aspectual Approach 24

2.1.2.3 Causal Approach 27

2.2 Theoretical Framework 28

2.2.1 Root-Event Schema Event Structure 29

2.2.1.1 Architecture of Event Structure 30

2.2.1.1.1 Semantic Root 31

2.2.1.1.2 Event Schema 34

2.2.1.2 Argument Linking 35

2.2.2 Syntactic Representation 38

2.3 The Causative Alternation 43

2.3.1 Intransitive Base Approaches 45

2.3.2 Transitive Base Approaches 46

2.3.3 Common Base Approaches 47

2.3.4 Previous Work on Urdu-Hindi Causatives 50

2.4 Implications for the Present Study 55

2.5 Conclusion 58

3. Methodological Considerations 60

3.1. Research Design 60

3.2 Data Collection 62

3.2.1 Data: Change of State (COS) Verbs 62

3.2.2. Data Sources 69

3.2.2.1 Lexical Translation 70

3.2.2.2 Urdu WordNet 71

3.2.2.3 Urdu Lughat 72

3.2.2.4 Introspection 77

3.2.2.5 Acceptability Judgment Task 79

3.3 Data Analysis Procedure 83

3.4 Conclusion 86

4. Causative Derivation 87

4.1 Gradient Productivity 88

4.2 Dynamic Productivity 99

4.3 Morphological Operations: Morpholexical or Morphosyntactic? 107

4.4 Lexical Distinctions for the Causative Alternation 112

4.4.1 Urdu COS Verbs and Lexical Distinctions 115

4.4.1.1 Anticausative-Only COS Verbs 115

4.4.1.2 Direct-Causative-Only COS Verbs 117

4.4.1.3 2-Variant (C^{anti} & C^{d}) COS Verbs 120

4.4.1.4 2-Variant (C^{d} & C^{ind}) COS Verbs 122

4.4.1.5 3-Variant Alternating COS Verbs 124

4.4.2 Causal Responsibility: An Alternate Proposal 127

4.4.3 Causal Responsibility and Urdu COS Verbs' Lexical Distinctions 137

4.5 The Interface Nature of the Lexicon 146

4.6 Conclusion 150

5. Event Structure 153

5.1 Semantics of Causative Derivation 153

5.2 Basic Event Structure 156

5.2.1 Denial of Result 158

5.2.2 Directed Change 160

5.2.3 Conjuctive Participle Construction 173

5.3 Derived Event Structures 181

5.4 Conclusion 188

6. Argument Licensing 190

6.1 Argument Structure in the Urdu COS Verbs 190

6.1.1 Syntactic Categorization of Semantic Arguments 191

6.1.1.1 Root or Event Schema Arguments? 192

6.1.1.2 Obligatory vs. Optional Arguments 198

6.1.2 Syntactic Arguments and the Causative Alternation 202

6.1.2.1 Case Alternation 208

6.2 The Linking Algorithm 217

6.2.1 Event Structure Geometry Principle 218

6.2.2 Causal Responsibility Principle 219

6.2.3 The Directed Change Linking Rule 220

6.2.4 The Direct Cause Linking Rule 224

6.2.5 The Indirect Cause Linking Rule 225

6.3 Conclusion 227

7. Conclusions 229

7.1 First Research Question 230

7.2 Second Research Question 233

7.3 Third Research Question 236

7.4 Fourth Research Question 239

7.5 Areas for Future Study 246

7.6 Concluding Remarks 249

Appendix A List of the Urdu COS Verbs 250

Appendix B Acceptability Judgment Task 252

Appendix C Acceptability Judgment Task (A Sample in English) 269

References 270

Chapter 1

Introduction

1.1 Background of the Study

Much of the current research on the semantics-syntax interface concerns the role of verb meaning in argument realization, a mapping between lexical semantic structure, argument structure, grammatical relations, and their morphosyntactic expression (Croft, 1990, 2012; Gisborne, 2010; Jackendoff, 1990; Levin, 2018; Levin & Rappaport-Hovav, 2005; Mohanan, 1994; Pustejovsky, 1991a; Rappaport-Hovav & Levin, 1998a; Rappaport-Hovav, Doron & Sichel, 2010; Rothstein, 2004, among others). In this connection, the recent generative literature offers two differing positions. The lexicalist/projectionist account (Dowty, 1979; Jackendoff, 1990; Pustejovsky, 1991a; Rappaport-Hovav & Levin, 1998a, among others) argues that the lexical entry of a verb registers its argument structure that determines the syntactic projection of its arguments. The syntactic/constructionist account (Borer, 2003, 2005; Hale & Keyser, 1993; Ramchand, 2008; Travis, 2000, among others), in contrast, argues that the lexical entry of a verb registers only its core meaning and it is the syntactic construction into which the verb is integrated that licenses its argument structure. Despite the differences on the role of verb meaning in argument realization, both approaches recognize a distinction between two facets of verb meaning: the semantic root[2] and the event schema (Levin & Rappaport-Hovav, 2005). The semantic root is the idiosyncratic part of verb meaning that distinguishes a verb from other members of the same class, and remains constant over various uses of the verb in different contexts; the event schema, on the other hand, is the event-related, structural part of verb

[2] The term "root" (Pesetsky, 1995) in a lexical event structural context is distinct from the notion of root used in morphology (e.g., Aronoff, 1994).

meaning that is relevant to determining the semantic class of the verb (Rappaport-Hovav & Levin, 1998a). This distinction is recognized by many researchers (Borer, 2003; Goldberg, 1995; Grimshaw, 1993, 2005; Hale & Keyser, 1993; Jackendoff, 2002; Michaelis & Ruppenhofer, 2001, among others). Understanding the properties of such building blocks as roots and event schema is central to understanding how the building blocks of one component of language (e.g., semantics) relate to those of another component (e.g., syntax) (Levinson, 2007). However, the challenge is to make precise the nature of the root/event schema distinction and their respective roles in multiple argument realization (Beavers, 2010; Levin & Rappaport-Hovav, 2005; Rappaport-Hovav, Doron, & Sichel, 2010). To this end, empirical evidence from diverse languages is required since evidence for one language may not work for all languages.

Against this background, the present study aims to examine the change-of-state (henceforth COS) verbs' semantic roots and event schemas, and their interactive role in causative alternation licensing in Urdu – a language predominantly spoken in Pakistan and India[3]. The causative alternation is a form of argument realization which involves a change in a lexical causative verb's argument structure, such that the transitive variant of a verb V means roughly "cause to V-intransitive" (Levin, 1993; Levin & Rappaport-Hovav, 1994, 1995; Schäfer, 2008). The examples in (1) and (2) below represent the phenomenon in English and Urdu respectively:

(1) a. Pat opened the door. Causative
b. The door opened. Anticausative
(Levin & Rappaport-Hovav, 1994, p.36)

(2) a. kʰana pək-a Anticausative
food.M.3SG cook-PRF.M.3SG
'Food became cooked.'[4]

[3] The South Asian language Urdu, spoken in Pakistan and India, is structurally so close to Hindi, one of the official languages of India, that some researchers refer to them as Urdu-Hindi or Hindi-Urdu (see Butt, 1995).
[4] Note that the passive English gloss given for (2a) and elsewhere in this thesis is not entirely accurate. The Urdu anticausative in fact has no passive interpretation (see Kachru, 2006; Ramchand, 2014).

b. ɪzza=ne kʰana pək-a-ya Direct causative
izza.F.3SG=ERG food.M.3SG cook-CAUS^{d}-PRF.M.3SG
'Izza cooked food.'

c. ɪzza=ne aɪʃa=se kʰana Indirect causative
izza.F.3SG=ERG aisha.F.3SG=INST food.M.3SG
pək-va-ya
cook-CAUS^{ind}-PRF.M.3SG
'Izza had Aisha cook food/caused Aisha to cook food.'

The morphology and adicity of the Urdu verb *pək* 'cook' in (2) change in parallel, and show three variations in argument structure: in its anticausative use, it is one-place argument predicate; in its direct causative use, with the addition of direct causative morpheme *-a*, the one-place argument predicate becomes two-place; in its indirect causative use, with indirect causative morpheme *-va*, the two-place predicate becomes three-place. Along with the correlation between morphology and argument structure comes another observation that prompts this study: the Urdu COS verbs come in three broad categories: anticausative-only, direct-causative-only, and alternating. (3), (4) and (5) below illustrate this observation:

(3) Anticausative-only COS verbs

apʰər 'distend', akəṛ 'stiffen', pətʰra 'become stone', təṛək 'crack', mʊrjʰa 'wither'

a. pʰul mʊrjʰa-ya
flower.M.3SG wither-PRF.M.3SG
'The flower withered.'

b. *mali=ne pʰul mʊrjʰa-ya
gardener.M.3SG=ERG flower.M.3SG wither.CAUS^{d}-PRF.M.3SG
'The gardener withered the flower.'

(4) Direct-causative-only COS verbs

bɪlo 'churn', pətʰ, 'cake', kʊtər, 'snip', kʊcəl 'crush'

a. gaṛi=ne rəhgir kʊcl-a
car.F.3SG=ERG passer-by.M.3SG crush.CAUS^{d}-PRF.M.3SG
'The car crushed the passer-by.'

b. *rəhgir kʊcl-a
passer-by.M.3SG crush-PRF.M.3SG
'The passer-by got crushed.'

(5) Alternating COS verbs

jəl ‘burn’, jəm ‘freez’, pɪg^{h}əl ‘melt’, ʈuʈ ‘break’, pək ‘cook’, sʊkəṛ ‘shrink’, suk^{h} ‘dry’

a. ləkṛiã jəl-ĩ
   woods.F.3PL burn-PRF.F.3PL
   ‘The woods got burnt.’
b. admi=ne ləkṛiã jəl-a-ĩ
   man.M.3SG=ERG woods.F.3PL burn-CAUS^{d}-PRF.F.3PL
   ‘The man burnt the woods.’
c. admi=ne ləṛke=se ləkṛiã jəl-va- ĩ
   man.M.3SG=ERG boy.M.3SG=INST woods.F.3PL burn-CAUS^{ind}-PRF.F.3PL
   ‘The man had the boy burn the woods.’

The terms ‘causative’ and ‘anticausative’ refer to the transitive and intransitive variant of an alternating verb respectively. The term ‘anticausative’ means that the cause element is eliminated from the linguistic coding, but not from the conceptual structure of a causal event; it is not taken to mean an inchoative verb derived from its causative counterpart (see Rappaport-Hovav, 2014a). The terms ‘direct’ and ‘indirect’ refer to whether the cause argument is directly (without an intermediary agency) or indirectly (with an intermediary agency) involved in the event. The distinction between direct and indirect causation is discussed in Chapter 4. The above variation in the Urdu COS verbs’ behavior with respect to the causative alternation poses a question as to what licenses these verbs to behave (non)alternatingly.

1.2 Research Problem

Motivated by the Urdu COS verbs’ (non)alternating behavior, the present study explores how the Urdu COS verbs’ semantic roots and event schemas interact in their influences on licensing the causative alternation. In addressing this main research problem, no account can exclude the correlation between the Urdu COS verbs’ morphology and argument structure as well as their above-mentioned three categories with respect to (non)alternating behavior. So the first subproblem is to examine the morphological relations between the Urdu COS verbs’

causative alternation variants so as to make explicit the basic/derivative distinction, if any. The second subproblem then is to build on the evidence from the first subproblem and further explore the lexical semantic relations between the morphological variants in terms of the semantic root-event schema-based event structure assumed in this study. The third subproblem is to explore combinatory relations between the COS verbs' roots and event schemas for designing the Urdu COS verbs' lexical semantic representation which provides a foundation for causative alternation licensing. The fourth subproblem is to determine the nature of mapping between the Urdu COS verbs' lexical semantic representation and the relevant syntactic representation with respect to the causative alternation. To further delineate the main research problem and its sub-problems, this study addresses the following research questions:

1. Given the three morphological variants, which one is basic and which ones are derived?
2. How does the morphological structure relate to the lexical semantic structure?
3. How does a semantic root relate to an event schema in a verb's semantic representation?
4. How does a root-event schema-based representation map onto a syntactic representation?

These research questions instantiate the main concern in linguistics: the explicit characterization of grammatical knowledge. The basic assumption underlying all the questions is that the semantic distinction between verbs' root and event schema components is central to understanding their syntactic behavior. However, wherever relevant, the explanation also refers to how grammar interacts with non-lexical contextual factors such as high frequency of co-occurrence of arguments in human observation. The main thrust of this study is the formulation of licensing conditions on the Urdu COS verbs' arguments with respect to the causative alternation. The next section briefly introduces the assumptions this study makes concerning the lexical semantic side as well as the syntactic side of the lexical semantics-syntax interface in terms of which this study frames its overall argumentation.

1.3 Theoretical Assumptions

With respect to argument alternation, two main types of analyses emerge in the literature: structure-driven and meaning-driven (Levin & Rappaport-Hovav, 2005). The structure-driven analyses assume that argument alternations are alternate modes of realizing a single set of arguments without any meaning differences, and focus on the formal mechanisms relating the variants typically stated over syntactic representations. The meaning-driven approaches, in contrast, capitalize on the meaning differences between the variants and assume that the distinct meanings might be the source of the distinct argument realizations. However, the latter approaches differ with respect to the meaning components taken to define alternations.

In a traditional semantic role approach, each verb is associated with relevant semantic roles which are meant to bring about similarities and differences in verb meaning that are reflected in argument expression (Dowty, 1991; Fillmore, 1968). Due to lack of consensus on semantic role inventory and explanatory inadequacy for argument alternation, some lexical semanticists decompose verb meaning instead of semantic roles. In this predicate decomposition approach, lexical semantic representation is formulated in terms of primitive predicates chosen to represent meaning components that recur across significant sets of verbs (Croft, 1990, 1998; Jackendoff, 1990, 2002; Rappaport-Hovav & Levin, 1998a; Van Valin & LaPolla, 1997). The predicate decomposition-based representations are commonly called event structures because they posit grammatically relevant event types. To address the issues raised in section 1.2 above, the present study takes as its theoretical base the event structure approach to verb meaning as put forward in Levin (1993, 2009), and Levin and Rappaport-Hovav (2005) and Rappaport-Hovav & Levin (1998a). This event structure account assumes the bipartite view of verb meaning: semantic root and event schema. The lexical semantic representations are characterized by two

important structural design properties: (a) semantic root/event schema distinction, and (b) subeventual analysis. Root's ontological category determines the event schema type of a verb, and is integrated into event schema either as an argument or as a modifier of some primitive predicate. The subevent analysis includes the distinction between simple event structure, having a single subevent, and complex event structure, having two subevents.

As to the syntactic side of the interface between the lexical semantics and syntax, this study assumes most of the proposals Culicover and Jackendoff (2005) present in their Simpler Syntax model of sentence structure. In this account, language comprises a number of independent generative systems (phonology, syntax and semantics) correlated via constraint-based interface systems. Syntax mediates between the linearly ordered phonological string of words and the highly hierarchical but linearly unordered structure of meanings. Lexical items serve as interface rules to establish the correspondence of certain syntactic constituents with phonological and conceptual structures. Syntax is relatively flat, and linearly ordered headed phrases correspond to constituents in the semantic representation. A phrasal node typically has a unique lexical node as its head; all its other dependents are either phrasal or minor categories. In contrast to the major lexical categories N, V, A, P, and Adv, the minor categories such as Det and Modal do not generally have phrasal nodes. Phrase structure rules are taken as constraints on possible structures, and are divided into constituency rules and linear order rules, which has an advantage in dealing with free word order phenomena. For bringing syntax close to meaning, no hidden levels of syntax are assumed and positional change of a constituent is accounted for in terms of interface principles. However, a second level of syntax called the "Grammatical Function tier" is posited for the mapping between syntax and semantics.

1.4 Research Design

For addressing the research problems given above in section 1.2, the present study takes seriously the assumption that the adequacy of theory is bound up with the reliability of empirical evidence. Much care is, therefore, taken to ensure quality data. For our research questions, two main requirements include the descriptive data on the Urdu COS verbs' morphology, semantics and syntax, and its inductive analysis. For these requirements, qualitative research design is deemed relevant because in it, the abstractions are built on the particulars, accommodating new linguistic details emerging during the process of investigation. In terms of inquiry mode, the present study is conducted primarily as a qualitative case study for an intensive analysis of the bounded system of the Urdu COS verbs' causative alternation. However, to evaluate the likelihood of some hypotheses, the data collected from lexical resources (WordNet and Urdu Lughat) and experimentation is subjected to descriptive statistics for frequency count of verbs' behavior. As to theory development strategies (Meleis, 2012), this study assumes a theory-to-research-to-theory strategy in that its research questions were framed within the Parallel Architecture of language proposed by Jackendoff (1997, 2002) and a particular theory of argument realization proposed by Rappaport-Hovav and Levin (1998a), and that its research findings might, in return, inform these theoretical bases.

COS verbs encode such a basic cognitive category as causation and also show cross-linguistic diversity in semantics and morphosyntax. Such a core semantic type makes an ideal focus for the study of both language universals and cross-linguistic variations. The present study concerns COS verbs' grammatically-relevant semantic properties in the manner of Fillmore (1970) and Levin (1993); however, it also explores how various attribute-value matrices lexicalized by COS verbs (root components) interact with their event schemas and affect their

potentiality to participate in the causative alternation. To be more specific in the treatment of COS verbs, the domain of concrete COS events, as opposed to abstract events, was taken centrally to include the kind of events which entail a specific change in an entity's perceptible properties such as appearance, dimension, surface integrity, texture, color, etc.

This study assumes that "Multi-source evidence can either validate the theory or bring contradictory results, therefore opening new perspectives" (Grisot & Moeschler, 2014, p.10). Therefore, the data collection process is multistage and includes five main sources to explore the maximum space of grammatical possibility: lexical translation, Urdu WordNet, Urdu Lughat, individual and dialogical introspection, and acceptability judgment task. This study assumes that members of semantically coherent verb classes show more or less similar syntactic behavior because certain facets of their lexical semantic representation are preserved in the syntactic realization of their arguments and this basic assumption guides the data analysis stage.

1.5 Basic Clause Structure in Urdu

This section outlines some aspects of the Urdu-Hindi syntax which are directly relevant to the patterns the present study explores. As an SOV language, as observed by Kidwai (2000), Urdu-Hindi patterns its constituents in the default order "subject-indirect object-direct object-adjunct(s)-verb-auxiliaries", as in (6).

(6)

nur=ne	anjum=ko	kıtab	di
noor.M.3SG=ERG	anjum.F.3SG=ACC	book.F.3SG	give.PRF.F.3SG

'Noor gave Anjum a book'.

This order is, however, less than rigid, and arguments may appear dislocated to the left as well as to the right of the verb. Native speakers usually judge these orders to be entirely optional and discourse-driven. The scrambling possibilities are deviations from the canonical order and are accompanied by non-neutral stress and intonation, differences in presupposition, and shifts in

prominence, emphasis and other discourse effects. Since the syntactic functions are specified by case endings, they can potentially be rearranged in different word orders. Following Mohanan (1994) and Butt (1995), this study assumes that Urdu displays non-configurationality and has the basic clause structure shown in (7), i.e., NPs and a single $\overline{V}$ may appear in any order.

(7) $\{_S NP^*, \overline{V}\}$

$\overline{V}$ is used in place of VP to represent the non-configurational character of Urdu-Hindi in which the status of VP node is not stable to capture subject/non-subject asymmetry in terms of categories (see Mohanan, 1994). Butt's (1995) $\overline{V}$ formation "$\overline{V} \rightarrow$ V(V) (STAT) (AUX)" is recast in Simpler Syntax as "$\{_{\overline{V}}$V (V) (STAT) (AUX)$\}$" to represent constraint-based nature, not rewriting type, of phrase structure rules. Following Culicover and Jackendoff's (2005) Simpler Syntax hypothesis, the phrase structure rules are divided into constituency rules and constituent order rules. Table1 below illustrates this distinction with respect to the causative alternation.

Table 1

Phrase structure rules for the Urdu causative alternation variants

Variants	Constituency Rule	Linear Order Rule
Anticausative	$\{_S$ NP $\overline{V}\}$	NP $>_{default}$ $\overline{V}$
Direct causative	{s NP_1 NP_2 $\overline{V}$}	$NP_1 >_{default} NP_2 >_{default} \overline{V}$
Indirect causative	{s NP_1 (NP_2) NP_3 $\overline{V}$}	$NP_1 >_{default}$ (NP_2) $>_{default} NP_3 >_{default} \overline{V}$

Note: In anticausative, NP = patient as subject; In direct causative, NP_1 = cause as subject and NP_2 = patient as direct object; In indirect causative, NP_1 = indirect cause as subject, NP_2 = intermediary causee as oblique and NP_3 = patient as direct object.

''X $>_{default}$ Y'' means that X preferably precedes Y, i.e., this is the default order. This study follows Mohanan (1994) and Butt (1995) in assuming that Urdu-Hindi has a flat structure and direct daughters of S can scramble freely. The possible permutations of a typical Urdu verb's causative alternation variants are shown in Table 2 below:

Table 2

Linear order permutations in an Urdu verb's causative alternation variants

Variants	**Default Order**	**Scrambled Orders**
Anticausative	(S V) cavəl pək-e rice.M.3PL cook-PRF.M.3PL 'Rice became cooked.'	pək-e cavəl (V S)
Direct causative	(S O V) mã =ne cavəl pək-a-e mother.F.3SG=ERG rice.M.3PL cook-CAUS^{d}-PRF.M.3PL 'The mother cooked rice.'	a. mã=ne pək-a-e cavəl (S V O) b. cavəl mã=ne pək-a-e (O S V) c. cavəl pək-a-e mã=ne (O V S) d. pək-a-e mã=ne cavəl (V S O) e. pək-a-e cavəl mã=ne (V O S)
Indirect causative	(S Obl O V) izza=ne mã =se cavəl pək-va-e izza.F.3SG=ERG mother.F.3SG=INST rice.M.3PL cook-CAUS^{ind}-PRF.M.3PL 'Izaa had the mother cook rice.'	a. izza=ne mã=se pək-va-e cavəl (S Obl V O) b. izza=ne pək-va-e mã=se cavəl (S V Obl O) c. pək-va-e izza=ne mã=se cavəl (V S Obl O) d. izza=ne cavəl mã=se pək-va-e (S O Obl V) e. cavəl izza=ne mã=se pək-va-e (O S Obl V) f. cavəl mã=se izza=ne pək-va-e (O Obl S V) g. izza=ne cavəl pək-va-e mã=se (S O V Obl) h. mã=se izza=ne cavəl pək-va-e (Obl S O V) i. mã=se cavəl pək-va-e izza=ne (Obl O V S) j. mã=se cavəl izza=ne pək-va-e (Obl O S V)

As demonstrated in (8) below, lexical items cannot in general freely scramble out of or within phrasal constituents. In (8a), the $\overline{V}$ is a complex predicate and contains two elements: a main verb *pək-va*, and a light verb *di-e*. As (8b) shows, an attempt to scramble the two elements within or out of the $\overline{V}$ may produce an ill-formed result.

(8) a. [$_{NP}$ izz=ne [$_{NP}$ mã=se] [$_{NP}$ cavəl]
izza.F.3SG=ERG mother.F.3SG=INST rice.M.3PL
[$_{V}$ pək-va di-e hɛ̃]
cook-CAUS^{ind} give.PRF.M.3PL be.PRS.3PL
'Izaa has had the mother cook rice.'
b. *__di-e__ izza=ne mã=se __pək-va__ cavəl __hɛ̃__

The following brief description of Urdu-Hindi nominal and verbal systems draws mainly on Butt (1995, 2006), Butt and King (2003, 2005), Kachru (2006) and Mohanan (1994). An Urdu noun inflects for number, gender and case. The nominal system employs a two-way number system (singular and plural) and a two-way gender system (masculine and feminine). For number, inflection generally marks plurality (e.g., *ləṛka* 'boy' → *ləṛke* 'boys') and for gender, animacy carries weight: in inanimate nouns, gender is arbitrary (e.g., *kıtab* 'book' is feminine, while *qələm* 'pen' is masculine); in animate nouns, gender corresponds to the sex of the referent (e.g., *ləṛka* 'boy' is masculine, while *ləṛki* 'girl' is feminine). Natural gender and grammatical gender coincide for human nouns. The Urdu pronominal system does not encode gender distinction, but it does reflect the two-way number system as well as a three-way person system (1st, 2nd and 3rd persons). For example, in (a) *vʊh kʰana pəkata tʰa* 'he cooked food', (b) *vʊh kʰana pəkati tʰi* 'she cooked food', (c) *vʊh kʰana pəkate tʰe* 'they cooked food' and (d) *vʊh kʰana pəkatɪ̃ tʰɪ̃* 'they cooked food', *vʊh* refers to 'he' in (a), 'she' in (b) and 'they' in both (c) and (d); it reflects its gender through verbal inflection. Syntactically, a nominal co-occurs with determiners (*yıh kıtab* 'this book'), adjectives (*pʊrani kıtab* 'old book') and postpositions (*kıtab m*ẽ, 'in the book'), and functions as subject of a sentence (***kıtab*** *nice gır gəi* 'the book fell down'), object of a verb (*ləṛke=ne* ***kıtab*** *nice gıra di* 'the boy dropped the book down'), object of a postposition (*həmẽ yıh həvala pʊrani* ***kıtab mẽ*** *mıla* 'we found this reference in the old book'), complement of a linking verb (*yıh ek* ***kıtab*** *hɛ* 'this is a book'), modifier of a noun in a compound noun (*len den* 'give and take'), and a constituent of a complex predicate (***yəqin*** *kərna* 'believe').

Since Urdu is a pro-drop language, the subject, direct object and indirect object nominals can be omitted. Thus, *pəkaya* 'cooked' may mean that I/we/you/he/she/they cooked something singular in number and masculine in grammatical gender, while, *pəkai* 'cooked' may mean that I/we/you/he/she/they cooked something singular in number and feminine in grammatical gender. On the other hand, *pəkae* 'cooked' and *pəkaĩ* 'cooked' are plural-masculine and plural-feminine forms of base verb form *pək* 'cook'. Due to rich verb morphology, subjects and objects can be dropped. As to the case system in Urdu, nominative case is unmarked, while oblique and vocative case forms are morphologically marked; all other cases are indicated by clitics: ergative case is marked by *ne,* accusative/dative by *ko*, instrumental by *se*[5], and locative by *mẽ* 'in', *pər* 'on', etc. A subject may bear nominative, ergative, dative, instrumental, locative, or genitive case. An object of a diadic verb may be either accusative or nominative.

In the Urdu-Hindi verbal system, the morphological forms of a verb typically include root (e.g., *jəl* 'burn'), infinitive (e.g., *jəlna*), imperfect (e.g., *jəlta*), perfect (e.g., *jəla*), direct causative (e.g., *jəla*), and indirect causative (e.g., *jəlva*). Verbs inflect for aspect, tense, mood and agreement features of gender, number and person. Syntactically, verbs determine the number and function of nominal arguments. Urdu makes a clear distinction between three aspects: imperfect, perfect and progressive. The imperfect and perfect aspects are marked morphologically, while the progressive is marked periphrastically. The imperfect is formed by suffixing *-tA* to the verbal root, and the perfect, by suffixing *-A* to the verbal root. The *-A* is realized according to the gender and number of the noun with which the verb agrees. The *-A* is realized as *-a* in the masculine singular, *-e* in the masculine plural, *-i* in the feminine singular, and *-ĩ* in the feminine plural. The simple past tense is homophonous with perfect aspectual form, and all other tenses are marked

[5] The marking *se* indicates, among other meanings, both instruments and sources. This study uses 'instrumental' to refer to both instrumental and ablative case features.

by tense auxiliaries. The imperfect participle combines with present tense auxiliary *hA* to form present imperfect and with past tense auxiliary *t^hA* to form past imperfect. Likewise, the perfect participle combines with present tense auxiliary *hA* to form present perfect tense and with past tense auxiliary *t^hA* to form past perfect tense. The *-A* changes to reflect agreement in gender and number. The progressive aspect is indicated by a verbal root followed by *rəhA*. The imperfect and perfect forms are followed by the future tense auxiliary to form imperfect and perfect future tenses. The progressive aspect occurs with tense auxiliaries *hA*, *t^hA* and *ho + gA* to form present, past and future progressive tenses respectively. As pointed out by Ramchand (2011), the simple past tense in Urdu-Hindi is formed from a perfective participle which agrees with the nominative argument in gender and number. The perfective participle in the simple verb stem and the masculine singular agreement ending, the *-a/ya* vowel, is homophonous with the direct causative marker *-a*. However, the agreement complex is always the most peripheral morpheme in the word. As to the active/passive distinction, the active verb occurs in all aspect-tense forms and shows agreement features of gender, number and person. The passive voice is marked by the passive auxiliary *ja*, which follows the past participle form of the main verb. The element *ja* carries gender, number and person agreement markers. The Urdu verb exhibits agreement in gender, number and person with its subject if it is nominative. If the subject is not nominative, the verb agrees with the object if that is nominative. If the object is also non-nominative, the verb is in the neutral form, namely, masculine third person singular. So the verb agrees with the highest argument associated with nominative case.

1.6 Outline of the Thesis

In addition to this introductory Chapter 1, there are six other chapters. They are organized as follows. Chapter 2 provides the theoretical background that is needed to contextualize the

analysis of the Urdu COS verbs' causative alternation in terms of semantic root-and-event-schema-based event structure. After reviewing various proposals on grammatically relevant lexical semantic representation, this chapter sketches the set of assumptions the present study makes as to the lexical decomposition and the syntactic representation, in which it frames most of its argumentation. Then, the current accounts of the causative alternation in general and the previous work on Urdu-Hindi causatives in particular are examined to provide theoretical motivation for the research questions raised in this study.

Chapter 3 presents the research design to address the questions motivated in Chapter 2. This chapter originates in the assumption that sharpening data by multi-source evidence is a necessary step for a holistic approach towards a valency-changing derivation, which examines a phenomenon in the context of the overall grammatical organization of a language, by focusing on how its components (morphology, syntax, semantics, etc.) interrelate. Considering a crucial relation between the reliability of evidence and the adequacy of theory, this chapter lays out the research methodology to address the research problems stated above. It presents rationale for overall research design and deals with the nature of data required, data sources and tools, and data collection procedure. In the final section, data analysis procedure is explained.

Given that Urdu primarily involves a morphologically mediated directed alternation, Chapter 4 uses morphological evidence to characterize the basic/derived distinction between variants of the Urdu COS verbs, explores the morphological operations involved in the derivation of the variants, and shows gradient and dynamic productivity in these operations. It then elaborates the semantic and syntactic effects of the causative operations, and deals with the lexical distinctions among the Urdu COS verbs in terms of the notion of "causal responsibility". It also shows how the causative operations reveal the interface nature of lexicon. This chapter

provides sufficient foundation to further investigate the nature of morphologically signaled relations between the Urdu COS verbs' lexical semantic representations, argument structures and grammatical relations in the next chapters.

Chapter 5 builds on the interaction between morphosyntax and lexical semantics of the causative alternation variants discussed in Chapter 4, and further explores the nature of lexical semantic relation between the variants. More particularly, it is concerned with the combinatory relation between semantic roots and event schemas that provides a foundation for the causative alternation licensing. This chapter first motivates the need for a decompositional semantic framework we need to find out what lies in the basic variant's semantic root and how it relates to the semantics of other derived variants. Then it looks into the basic variant's lexical semantic representation and explores grammatically relevant meaning components lexicalized in it, with reference to manner/result distinction in semantic root. Finally, it examines the relation between the semantics of basic variant and that of the derived variants in terms of event structure account.

Chapter 6 takes as a theoretical base the nature of the combinatory relation between the Urdu COS verbs' semantic roots and event schemas as discovered in Chapter 5, and examines how a root-event-schema-based lexical semantic representation maps onto a syntactic representation for licensing the Urdu COS verbs' causative alternation. More specifically, it involves the relationship between lexical semantic structure, lexical syntactic structure, grammatical relational structure and phrase structure. This chapter also formulates the rules for mapping the lexical semantic representations of the Urdu COS verbs' causative alternation variants to their respective syntactic representations.

The final Chapter 7 presents the overall conclusions of the study.

Chapter Two

Literature Review

The present study primarily explores the nature of the lexical semantics-syntax interface with respect to the causative alternation. It is empirically easier to characterize the syntactic side than the semantic side of the interface; the latter, unlike the former, has no physical manifestation and thus, is more susceptible to disagreement about the syntactically relevant meaning components. This chapter concerns the relevant background issues and reviews the previous work on verb's lexical semantic representation concerning argument realization. Section 2.1 surveys different forms of lexical semantic representation from semantic role list to predicate decomposition called event structure. Section 2.2 deals with the semantic root-event schema-based representation laid out in Levin (2006, 2009, 2015a), Levin and Rappaport-Hovav (2005, 1995, 2011), and Rappaport-Hovav and Levin (1998a), in terms of which the analysis of the Urdu causative alternation is framed. The section also outlines the syntactic side of the lexical semantics-syntax interface. Various approaches to the causative alternation and previous work on Urdu-Hindi causatives are examined in section 2.3. Section 2.4 presents implications for the present study, and section 2.5 concludes the chapter.

2.1 Lexical Semantic Representation of Verbs

A great deal of research in syntactic theory starts from the premise that verb meaning constrains its syntactic behavior in that "a verb's lexical entry registers some kind of semantically anchored argument structure, which in turn determines the morphosyntactic expression – or projection – of its arguments" (Levin & Rappaport-Hovav, 2005, p.186). Thus, in this tradition, what is crucial to the design of language is the distinction between lexical

semantic information that has systematic grammatical effects and information that does not (Grimshaw, 1993; Higginbotham, 1989; Jackendoff, 1990; Johnson, 2008; Pinker, 1989; Rappaport-Hovav & Levin, 1998a, among others). The recent neuropsychological evidence suggests different levels of mental representations for these two dimensions of lexical meaning (see Kemmerer, 2000). However, due to the complex nature of verb meaning, theories differ on the choice of grammatically relevant lexical semantic representation, and as a result, the nature of semantics-syntax mapping algorithm (Croft, 2012; Culicover & Jackendoff, 2005; Grimshaw, 1990, 2005; Levin & Rappaport-Hovav, 1995, 2005; Van Valin, 2005, among others). The most widely adopted lexical semantic representations can be broadly categorized either as semantic role-based or as predicate (event)-based.

2.1.1 Semantic role approach.

A semantic role approach assumes the grammatically relevant facets of a verb's meaning to be its arguments' semantic roles, the roles that the event participants play in the event[6] denoted by the verb (Blake, 2001; Croft, 2012; Fillmore, 1968). For instance, the English transitive verb *break* and its Urdu counterpart *toṛ* might be associated with the roles *agent* (or *cause* in general) and *patient*. Since semantic roles represent relations of arguments to predicates, they were originally motivated to establish a correspondence between lexical semantic categories and syntactic categories (Bierwisch, 2006). For such correspondence, this approach assumes a semantic role hierarchy to account for prominence relation among arguments and asymmetry between semantic roles and subject/object selection (Levin & Rappaport-Hovav, 2004). Fillmore's (1968) subject selection rule, for instance, takes semantic role labels as its starting point: "If there is an A [=Agent], it becomes the subject; otherwise, if there is an I [=Instrument],

[6] The term 'event' is used as a superordinate term for all lexical aspectual categories such as state, activity, achievement, accomplishment, etc.

it becomes the subject; otherwise, the subject is the O [=Objective, i.e., Patient/Theme]" (p.33). Fillmore's (1971) role hierarchy "Agent > Experiencer > Instrument > Patient > Goal/ Source/ Location > Time" represents an early attempt to capture what Levin and Rappaport-Hovav (2005) call context dependence: "the options for the syntactic realization of a particular argument are often not determined solely by its semantic role, but also by the semantic roles borne by its coarguments" (p.158). A role representation typically treats roles as atomic entities, assumes role uniqueness and employs a one-to-one mapping from semantic arguments to syntactic arguments, and thus, aligns with the Theta-Criterion[7], the Universal Alignment Hypothesis[8] and the Uniformity of Theta Assignment Hypothesis[9].

It is not always the case that theories define semantic roles and hierarchies in terms of event topology (Croft, 2012) whose contribution to argument realization was the original motivation for both of these theoretical constructs (Wechsler, 2015). Consequently, the roles and hierarchies proposed face one or another of the severe problems discussed in detail by Levin & Rappaport-Hovav (2005). To mention a few, in the absence of reliable diagnostics for identifying semantic roles, there is a lack of consensus on semantic role definitions and grain-size, which has led to what Dowty (1991) calls "role fragmentation". Second, most role inventories lack internal structure among roles, and thus, miss out cross-role generalizations. For instance, the Urdu adposition *ke sat*^{h}, like the English *with*, indicates both instruments and comitatives. "If each semantic role is taken to be discrete and unanalyzable, generalizations holding over more than one semantic role are not expected" (Levin & Rappaport-Hovav, p.41). Third, the instances of

[7] "Each argument bears one and only one theta-role, and each theta-role is assigned to one and only one argument" (Chomsky, 1981, p.36).
[8] "There exist principles of UG which predict the initial [grammatical] relation borne by each nominal in a given clause from the meaning of the clause" (Perlmutter & Postal, 1984, p.97)
[9] "Identical thematic relationships between items are represented by identical structural relationships between those items at the level of d-structure" (Baker, 1988, p.46)

one-argument-with-two-roles as in verbs of motion and transfer of possession (Gruber, 1976; Jackendofff, 1972), and the instances of two-arguments-with-the-same-role as in verbs like *resemble* (Dowty, 1991) deviate from one-to-one correspondence between arguments and roles. In latter cases, for instance, as in *This resembles/weighs as much as that*, "[T]wo arguments of the same verb do not seem to be distinguished from each other by any entailments that the verb produces, so that there would be no motivation for assigning distinct roles to them on semantic grounds" (Dowty, 1991, p.556). Fourth, the role hierarchies independent of event structure cannot help one predict from the definitions of theme and goal that theme outranks goal. Thus, role hierarchies fail to account for argument alternations. In short, the independence of role definitions and hierarchies of event geometry reduces the explanatory adequacy of role approach.

To address the problems faced by role approach, Dowty (1991) presents semantic roles not as atomic entities, but as cluster categories. Since arguments with a range of semantic properties pattern together, they must share a generalized semantic role label, not a set of jointly necessary and sufficient conditions on each semantic role. Dowty views semantic roles as prototypes defined in terms of lexical entailments which predicates impose on their arguments by virtue of the roles the arguments play in the event, and posits only two generalized roles – agent proto-role and patient proto-role. A proto-role is a set of lexical entailments that describe a prototypical participant's role. Agent proto-role is associated with volition, sentience, causation, movement and independent existence entailments, while patient proto-role with change, incremental theme, affectedness, stationary and dependent existence. These properties are independent and are not mutually exclusive (see Beavers, 2006). An argument that meets all the criteria will be a prototypical exemplar of the relevant roles. However, any given argument does not have to possess all the entailments associated with a particular proto-role. Dowty's Argument

Selection Principle states that for a given verb, the argument with the largest number of agent proto-role entailments is realized as the subject, and the one with the largest number of patient proto-role entailments is realized as object. Thus, the subject/object status is determined by the relative prototypicality of the arguments' roles to the proto-agent and proto-patient roles.

Dowty's theory has received criticism in recent literature. The assumption behind Dowty's proto-role approach is that all lexical entailments carry equal weight. However, the components of prototype concepts have been shown to be differentially ranked (Murphy, 2002). Many researchers point out the primacy of the cause entailment for subject selection (Ackerman & Moore, 2001; Davis, 2001; Davis & Koenig, 2000). Levin and Rappaport-Hovav (1995) also argue that linking rules are ordered (see section 2.2.3 below). Furthermore, Dowty's proposal is modest in application since Argument Selection Principle applies only to transitive predicates and complex patterns of subject linking of intransitives and oblique realization are not discussed in detail (Beavers, 2006). Since Dowty's proto-role theory is not fully grounded in event structure, it fails to account for the sources of lexical entailments and their ranking.

Like Dowty's proto-role approach, Role and Reference Grammar (RRG) (Van Valin, 2005; Van Valin & LaPolla, 1997) also posits two MACRO roles known as actor and undergoer. The macrorole actor generalizes across medium-grained roles such as agent, experiencer, instrument, recipient, source, and force, while the macrorole undergoer across the roles such as patient, theme, stimulus, recipient, and location. For macrorole assignment, the semantic roles available to arguments are arranged along a hierarchy, with the most agent-like roles at one end and the most patient-like roles at the other. Unlike Dowty, RRG defines the medium-grained semantic roles as argument positions in predicate decomposition substructures and formulates semantic hierarchy in terms of such substructures. However, as pointed out by Haspelmath

(2008), many syntactic processes like the omission of arguments can be described without referring to macroroles. RRG's logical structures incorporate event analysis, but do not fully ground principles in terms of event geometry.

2.1.2 Event structure approach.

Given the limitations of the semantic role approach, a large body of research argues that a verb's lexical semantic representation formulated in terms of event semantics would lead to a theory of argument structure with greater explanatory power (Croft, 1990; Engelberg, 1994, 2000; Grimshaw, 1993; Jackendoff, 1990; Levin & Rappaport-Hovav, 1995; Pustejovsky, 1995; Rappaport-Hovav & Levin, 1998a; Van Valin & LaPolla, 1997; Wunderlich, 1997, 2000, 2006, among others). The event-based predicate decomposition is based on the realization that grammar recognizes the complex structure of events (Tenny & Pustejovsky, 2000). As pointed out by Levin and Rappaport-Hovav (2005), such an event-based representation usually includes a subeventual analysis which indicates (i) the number and type of constituent subevents, (ii) the number and identity of the event participants in the particular subevent, and (iii) the nature of the temporal relations between the subevents.

Since event-based predicate decompositions are based on linguistically relevant event types and their internal structures, they are also called event structures. Event structures typically involve two types of elements: primitive predicates (ACT, CAUSE, BECOME, etc.) representing the meaning components shared by the whole verb class, and the idiosyncratic meaning component that distinguishes a verb from other class members. The event structural representation for a causative COS verb *dry* is given in (1); the state relevant to this verb is given in capital italics placed within angle brackets. (The representation in this example is from Rappaport-Hovav and Levin (1998a), but other notations are possible.)

(1) *dry*: [[X ACT] CAUSE [Y BECOME<*DRY*>]]]

The function-argument form of an event structure defines relations among the arguments with respect to the subeventual analysis, and helps explain why certain arguments co-occur, while others do not. Such relations cannot be defined in a proto-role analysis which simply associates lexical entailments with arguments. The reference to subeventual hierarchical organization lends event structures more explanatory adequacy. The section 2.2 details this type of event structure.

Event structures, however, differ on the choice of event properties relevant to argument realization. In this regard, approaches divide into three classes: the localist, the aspectual and the causal. The following draws on Levin & Rappaport-Hovav's (2005) review of these approaches.

2.1.2.1 Localist approach.

The localist approach (Gruber, 1976; Jackendoff, 1983) argues that various semantic fields have a similar function-argument structure, and that the primitive functions BE, STAY, GO and CAUSE, and the thematic relations theme, location, source, and goal evident in positional field (spatial location and motion events) can be harnessed to represent other semantic fields. The basic claim is articulated in Jackendoff's (1983) Thematic Relations Hypothesis: "In any semantic field of events and states, the principal event, state, path, and place functions are subset of those used for the analysis of spatial motion and location" (p.188). Semantic fields differ in three ways: "(a) what sorts of entities may appear as theme, (b) what sorts of entities may appear as reference objects, and (c) what kind of relation assumes the role played by location in the field of spatial expressions" (p.188). In later work, Jackendoff (1990) abandons the reduction of all events to spatial relations, and introduces other relations such as AFF(ect), a two-place relation between an actor and a patient. Jackendoff represents relations on two tiers: the 'thematic tier' for local relations, and the 'action tier' for the actor and patient roles.

However, it is really difficult to maintain that the notions of motion and location can account for all verb classes' behavior. Rappaport-Hovav and Levin (2005) point out that with causative change-of-state verbs and causative change-of-location verbs in English, the argument that undergoes the change shows different argument realization options, even though these classes are treated alike in localist analysis. Thus, spatial relations as assumed in localist approach do not seem to have direct bearing on subject and object selection. As illustrated by Levin and Rappaport-Hovav (2005), some three-argument verbs have subjects that are sources (e.g., *Travis gave the scooter to Taylor*) and others have subjects that are goals (e.g., *Taylor obtained/ borrowed a scooter*), while still others have subjects that are neither sources nor goals, but simply causes (e.g., *The assistant moved the meeting from 3:00 p.m. to 3:30 p.m.*).

2.1.2.2 Aspectual approach.

The aspectual approach focuses on the temporal and mereological (part structure) properties of predicates describing events. Much of the current work mainly focuses on the notions such as telicity, incremental theme and measure, and their relation to the direct object realization. Which notion is tied to direct object and how this is accomplished vary from theory to theory. Telicity (the property of naming a specific culmination point for the event) is typically represented either in terms of result state (e.g., Dowty, 1979), or mereological structure of events (e.g., Krifka, 1992). The result state view of telicity shows how telicity is compositionally calculated. For instance, *Brett swept the floor* is an activity, but adding the state *clean* yields the accomplishment *Brett swept the floor clean*. The mereological view of telicity takes telic predicates to be "indivisible" or "quantized", that is, they describe events which have no proper parts describable by the same predicate. Telicity is calculated from the interaction between the lexical semantic properties of the verb and those of the designate argument associated with it.

Much current work suggests that a designate argument is an incremental theme (Dowty, 1991) that is lexically associated with the property of mapping to events, that is, parts of the entity denoted by that argument can be mapped onto parts of the event denoted by the verb. This argument is involved in defining a homomorphism from the physical extent of its own referent to the temporal progress of the event (Krifka, 1992). By this definition, verbs like *read*, *write*, and *eat* are incremental theme verbs. However, as pointed out by Rappaport-Hovav & Levin (2005), the application of this term to the patient argument of COS verbs needs clarification. The patient of a COS verb is associated with a scalar property lexicalized by its verb, not the physical extent of the object, which serves as a scale for measuring the temporal progress of the entire event. For instance, the sentence *Matt closed the door halfway* doesn't entail that half the door was closed, but that the door was halfway closed. The mapping involves a property of the door and not the door's own physical extent.

Tenny (1994) characterizes the designate argument in terms of "measures out" the event. What measuring out means depends on the nature of the event. For instance, in an event of eating an apple, the apple measures out the event, since some quantity of apple is consumed during each interval of eating, until the apple is entirely consumed. The apple also delimits the event, since the eating event is over when the apple is entirely consumed. In *Sue walked the Appalachian trail* and *Jerry climbed the ladder*, the path measures out the event since the progress along the path determines the progress of the event, and its endpoint delimits the event. In case of COS verbs like *ripen* and *dry* whose patients Tenny characterizes as the measure, the event's temporal terminus is achieved by progressing along measurable degrees of change in some property central to the verb's meaning. Thus, she recognizes that it is not the actual extent of the direct object which is relevant to delimiting the event, but rather a scalar property of the object, such as

its ripeness or dryness. Progress along the scale is correlated with progress through the event. Telicity is thus represented by the endpoint of a scale. These theories, then, propose that verbs whose direct objects affect the telicity of the events are those which have an incremental theme or those which are associated with a scale determining the progress of the event.

The aspectual approach, however, has not gone unchallenged. Rappaport-Hovav and Levin (2005) point out that not all argument alternations are aspectually motivated. For instance, most dative verbs do not have incremental themes: a giving event, for example, does not usually involve the incremental transfer of possession of the theme, nor is the associated path of transfer an incremental theme. Also, the aspectual approach has little to say about why verbs with similar aspectual characterizations do not share argument realization possibilities. For example, COS verbs, such as *break, dim*, and *melt* have a more severely restricted range of argument realization options than the traditional incremental theme verbs, such as *eat, memorize,* and *read*.

Certain intransitive activity verbs are atelic in isolation, but telic in the resultative constructions. However, some of them can predicate a result phrase of their subjects directly, as in *The coats steamed dry,* while others can only do so through a reflexive pronoun, as in *Pat sang herself hoarse in two hours*. Moreover, only the subjects of verbs such as *steam* can be incremental themes without a fake reflexive, while the subjects of verbs such as *sing* cannot. Levin and Rappaport-Hovav (1995), and Rappaport-Hovav and Levin (1998a) attribute the contrasting behavior of such verbs not to telicity but to another quasi-aspectual property, which they term “event complexity”. The subevents in a complex event are not necessarily temporally aligned. Although two subevents are potentially distinguishable in each pattern of the resultative construction mentioned above, only the fake reflexive pattern qualifies as a complex event because the two subevents need not necessarily unfold together: the hoarseness need not set in

and develop simultaneously with the singing. The presence of the reflexive follows from the Argument-Per-Subevent Condition (Rappaport-Hovav & Levin, 2001) which requires one argument for each subevent. Thus, the notion of event complexity appears to work better than the aspectual notion of telicity.

2.1.2.3 Causal approach.

The causal approach to event structure takes causal notions to be central to determining argument realization. For instance, Croft (1991, 1998, 2012) models events as causal chains with a series of segments, each of which relates two participants in the event involving asymmetric transmission of force. Croft assumes that it is possible to distinguish in a particular use of a verb between what is presupposed and what is asserted or profiled. What remains constant across uses is the frame or base part of verb meaning. What is profiled can vary from use to use. In this way, the same causal chain can underlie more than one use of a particular verb, if each has a different portion of the chain profiled. The argument realization rules make reference to the causal chain lexicalized by a verb: the subject is the argument that causally precedes the object. This approach to subject and object selection does not single out a particular semantic property associated with either subject or object, but rather takes order in the causal chain to be the most important factor in determining subject and object choice. Argument alternations arise from differences in the profile associated with the verb in each variant.

Both aspectual and causal approaches converge on certain aspects of lexical semantic representation. As pointed out by Levin and Rappaport-Hovav (2005), since temporal ordering coincides with causal ordering, both approaches agree that the representation of events must impose a precedence order on the event participants. Both approaches also agree that it is an argument's role as cause which determines its subjecthood, not the attributes of volitionality and

sentience prototypically associated with animate causes. This is evident in when sentience is attributed to one argument and causation to a second, as with *frighten* psych-verbs, which have experiencer objects, and periphrastic causatives such as *The joke made me laugh*. Sentience must be distinguished from volitionality: volition entails sentience, but not vice versa, as in the case of *murder* and *fear*. Sentience should also be distinguished from animacy in its grammatical role. It is animacy, not sentience, which seems to be important to determining the coding properties of arguments bearing particular grammatical relations. For instance, differential object marking is sensitive to animacy (Aissen, 2003). In the causal approach, the causal notions take precedence over other factors in subject and object selection.

What emerges from this discussion is that the event structures relevant to argument realization may differ in whether they take into account the causal notions, aspectual notions, event complexity, or the notions involving an event participant's individual attributes such as volitionality, sentience and animacy. These are distinct, yet interrelated facets of verb meaning. Disregarding any of these aspects may result in a somehow insufficient account. In order for a lexical representation to be more holistic, it needs to be flexible enough in its design to accommodate more of these aspects. This sort of inclusivity enhances the cross-linguistic applicability of an event structure in that languages may differ in parametric permutations.

2.2 Theoretical Framework

This section lays out the type of event structure (root-event schema based) proposed in Rappaport-Hovav and Levin (1998a, 2010), Levin and Rappaport-Hovav (1995, 2005, 2011) and Levin (2006, 2009, 2015a & b), which is assumed in the present study. The choice of this event structural approach is based on its ability to encode grammatically relevant lexical semantic information in a way that is adequate for understanding the nature of the lexical semantics-syntax

interface. It is an exponent of the generative enterprise in the sense that it helps understand the interaction between lexical semantic and syntactic building blocks to generate all and only the grammatical expressions of a language. Having discussed the semantic side of the lexical semantics-syntax interface, this section also presents the set of assumptions the present study adopts for the syntactic side of the interface.

2.2.1 Root-event schema event structure.

Verbs individuate and name events, yet verb-event relations are not straightforward (Levin & Rappaport-Hovav, 2011). A verb lexicalizes only some of the attributes of an event, and thus provides a specific construal of that event. The set of event attributes a verb lexicalizes constitutes its meaning (Levin, 2015a). However, not all the attributes lexicalized by a verb have the same grammatical status. Only those meaning components that constrain verb behavior are grammatically relevant (Grimshaw, 2005; Levin & Rappaport-Hovav, 1995; Rappaport-Hovav & Levin, 1998a, among others). The fact that verb classes cross-classify in terms of their syntactic behavior implies that their members share syntactically relevant meaning components (Levin & Rappaport-Hovav, 1995). From this, it follows that grammatically relevant meaning components can be identified by identifying verbs' shared behavior patterns and shared meaning components since a similarity of syntactic structure is most likely mirrored in a commonality in meaning, and that a lexical semantic representation relevant to a verb's morphosyntactic aspects must ensure that these meaning components should be of appropriate grain size so that they not only tie verbs together into semantically coherent classes but also allow for the cross-classification of verbs. In addition, the representation must accommodate the idiosyncratic meaning components that distinguish among the class members.

2.2.1.1 *Architecture of event structure.*

The identification of grammatically relevant meaning components across semantically coherent verb classes presupposes the bipartite, hierarchical structure of verb meaning: a part that distinguishes among the class members and thus idiosyncratic to each member, referred to as "root", and a part shared by all members of the same verb class, referred to as "event schema" (Beavers & Koontz-Garboden, 2012; Rappaport-Hovav & Levin, 1998a, 2010). Each root component has an ontological type chosen from a limited set of options including state, result state, thing, stuff, surface/container, location, manner, instrument, and the set of roots is in principle open-ended. Event schema is the structural component of verb meaning, and is defined in terms of primitive predicates (ACT, CAUSE, BECOME, etc.) chosen to represent grammatically relevant meaning components shared by all members of the same verb class. An event schema, as noted by Beavers & Koontz-Garboden (2017), defines the causal and aspectual structure of the event (by defining the event's temporal (e.g., telicity and subevental structure) and causal contours through basic event-denoting predicates CAUSE, BECOME, and STATE), and a root fills in the real-world details of the event schema associated with a given verb. This bipartite structure of verb meaning can be represented in a function-argument form, as in (2).

(2) [[X ACT] CAUSE [BECOME [Y < *STATE*>]]]

In (3) below are given the event structures for an alternating COS verb *break*: (3a) represents causative variant and (3b) anticausative variant. The event schema is represented by primitive predicates ACT, CAUSE and BECOME and the semantic root by result state BROKEN. This event schema determines an endpoint-defining result state and the root just names that state.

(3) a. John broke the door: [[X ACT] CAUSE [BECOME [Y <*BROKEN*>]]]

b. The door broke: [BECOME [Y <*BROKEN*>]]

Roots are integrated into event schemas as either arguments or as modifiers of predicates; roots are italicized capitals placed in angle brackets when argument, as in (3), and notated via subscripts when modifiers, as in (4).

(4) John ran: [X ACT$_{<RUN>}$]

The combination of predicate primitives and roots governed by combinatoric rules generates various possible event structures (see (5) below). That verb meaning contains linguistically significant hierarchal structure is indicated by bracketing in the event structure (Beavers & Koontz-Garboden, 2012). The state primitive STATE and activity primitive ACT are basic building blocks and more complex event structures are generated by combining causative primitive CAUSE and change of state primitive BECOME (Koontz-Garboden, 2007). The construction of more complex event structures follows what Koontz-Garboden (2005) calls the Principle of Monotonic Composition: "Word meaning is constructed monotonically on the basis of event structure constants and operators" (p.100). That is, meaning, in form of primitives, can be added, but not removed (Rappaport-Hovav & Levin, 1998a). The design of such event structures capitalizes more on the common substructures which can help define grammatically relevant verb classes (Levin & Rappaport-Hovav, 1995; Rappaport-Hovav & Levin, 2011). The substructure in (3b) shared by all COS verbs, for instance, can help define the causative alternation verbs. However, this substructure is necessary, but not sufficient condition, for participating in the causative alternation, since not all COS verbs alternate. Exploring precise conditions for licensing the alternation is a primary motivation for the present study.

2.2.1.1.1 Semantic roots.

A root is an idiosyncratic component of verb meaning, representing a verb's core lexicalized meaning (Levin, 2009), and the arbitrary complexity in verb meaning is localized in it

(Grimshaw, 2005). Every root is characterized by an ontological type, as evidenced by denominal verbs demonstrating a clear semantic relation between the base noun and the related verb (e.g., if N such as *brush* names an instrument, V means 'use that instrument for its purpose') (Levin, 2009). A root's ontological category determines its association with event schema under certain canonical realization rules, as in (5) (Rappaport-Hovav, 2008; Rappaport-Hovav & Levin, 1998a, 2010).

(5) a. manner → [X ACT<*MANNER*>]
(e.g., jog, run, creak, whistle, . . .)

b. instrument → [X ACT<*INSTRUMENT*>]
(e.g., brush, chisel, saw, shovel, . . .)

c. container → [X CAUSE [BECOME[Y AT<*CONTAINER*>]]]
(e.g., bag, box, cage, crate, garage, pocket, . . .)

d. internally caused state → [X BECOME <*STATE*>]
(e.g., bloom, blossom, decay, flower, rot, rust, sprout, . . .)

e. externally caused state → [[X ACT] CAUSE [BECOME [Y <*STATE*>]]]
(e.g., break, dry, harden, melt, open, . . .)

Implicit in the canonical realization rules above is a lexicalization constraint: "A root can only be associated with one primitive predicate in an event schema, as either an argument or a modifier" (Rappaport-Hovav & Levin, 2010, p. 25). In a given event schema, for instance, a root can either be a modifier of predicate ACT or an argument of predicate BECOME, but cannot be associated with both these predicates at once. Thus, manner and result roots are in complementary distribution since there can be no root which expresses both manner and result at once.

According to manner/result complementarity hypothesis, "manner and result meaning components are in complementary distribution: a monomorphemic verb, stem, or affix lexicalizes only one" (Levin, 2015a, p.8). The manner verbs (verbs with manner roots) specify a manner of carrying out an action, such as *hit*, *smear*, *pour*, *shovel*, *stab*, etc., while the result

verbs (verbs with result roots) specify the result of an action, such as *break, cover, fill, empty, kill,* etc. The dichotomy crosscuts the semantic classes as well as the transitive/intransitive distinction, yet it is grammatically relevant: each type of verb shows its own argument realization options. (6) below from Rappaport-Hovav and Levin (1998a) illustrates the point.

(6) a. Unspecified Objects: Kim swept/*broke.

b. Non-subcategorized Objects: Kim scrubbed/*broke her fingers raw.

c. Causative Alternation: Kim broke/wiped the window; The window broke/*wiped.

It follows that verbs associated with similar root type should behave similarly, while verbs associated with different root types need not behave similarly.

The manner/result root distinction is characterizable in terms of the scalar/nonscalar change distinction: result roots specify scalar changes, while manner roots do not (Rappaport-Hovav & Levin, 2010). A scalar change refers to a value change in an attribute of an entity in a particular direction along the associated scale. For instance, the result verb *widen* specifies an increase in the value along a dimension of width. In contrast, a nonscalar change is complex in that it typically involves many changes at once. For instance, the manner verb *sweep* does not specify a particular change along a particular scale, but involves a specific, repeatable movement of a broom against a surface. Thus, roots through their ontological types influence argument realization. A root with more than one ontological type can combine with more than one event schema, thus defining more than one verb type, as with denominal verbs like *shelve*: 'put on shelves' (e.g., books), and 'provide with shelves' (e.g., a wall). On the other hand, different roots with the same root type combine with the same event schema, as in the case of deadjectival verbs like *dry, empty, warm*, etc. However, languages may differ in what is lexicalized in the root, thus

allowing crosslinguistic divergences in the class membership and size. Languages might differ, for instance, as to which states COS verbs lexicalize.

2.2.1.1.2 Event schema.

Event schema is the structural component of verb meaning, and is defined in terms of primitive predicates chosen to represent grammatically relevant meaning components shared by all members of the same verb class; it represents an event type taken from a limited inventory of the event types encodable in language (Levin & Rappaport-Hovav, 2011). The motivation for a limited set of primitives lies in their special organizing role (Wilks, 1987). However, in contrast to Wilks' proposal that the set of primitive predicates proposed should be able to exhaustively describe and distinguish the verbs of each language, the event structure adopting the root-event schema distinction, as assumed in this study, simply requires that the set of primitives should be able to describe all the grammatically relevant event types. What distinguishes between the verbs of the same event type is the root, not the primitive predicate (Levin & Rappaport-Hovav, 2011).

Generalizations about argument realization are formulated, not by referring to particular predicates in the event schema, but in terms of the architecture of event structure based on subeventual analysis. Thus, a distinction is recognized between complex event schema, consisting of two subevents, each having a well-formed event schema, and simple event schema, consisting of a single subevent (Levin & Rappaport-Hovav, 1999). To illustrate, a causative event structure in which an event causes another event has a complex event schema, as in (7a).

(7) a. Complex event schema
[X ACT] CAUSE [BECOME [Y <*STATE*>]]]

b. Simple event schema
[X ACT<*MANNER*>]
[X <*STATE*>]
[BECOME [X <*STATE*>]] (Levin, 2009, II, p.2)

The evidence for subeventual analysis comes from scope ambiguities involving various adverbials. For instance, a complex event affords the adverbial *again* more scope-taking options than a simple event. Thus, (8) shows both restitutive and repetitive readings, while (9) has only a repetitive reading.

(8) Dale closed the door again.
Repetitive: the action of closing the door was performed before.
Restitutive: the door was previously in the state of being closed, but there is no presupposition that someone had previously closed the door.

(9) John kicked the door again.
Repetitive: the action of kicking the door was performed before.

(Levin & Rappaport-Hovav, 2011, p.431)

The event schema as a structural component of an event structure defines hierarchical relations among arguments and allows for formulating argument realization rules in terms of the event structure geometry. The next section outlines the roles of root and event schema in argument linking, that is, how semantic arguments relate to syntactic arguments.

2.2.1.2 Argument linking.

Argument positions in event structure are licensed either by root or by event schema. A root must specify the minimum number of event participants, e.g., an event of *running* as in *Pat ran* ([x ACT$_{<RUN>}$]) minimally involves the runner, and an event of *pounding* as in *Leslie pounded the metal* ([x ACT$_{<POUND>}$ y]) minimally consists of a pounder and a surface (Levin, 2009). Most root participants are paired with positions in event structure. For instance, the subjects of *run* and *pound* in the above sentences realize such event structure positions. Not all root participants are, however, paired with positions in event structure. For instance, the object of *pound* in *Leslie pounded the metal* exemplifies such a pure root participant.

As to the contribution of event schemas to argument licensing, Levin (2009) observes that complex event schemas license two structure participants, one per subevent, realized as subject and object, while simple event schemas license one structure participant, realized as subject; any other arguments are licensed only by root, one of these may be realized as object, as in case of pounding event above. The actor argument of both complex and simple event verbs realizes a structure participant. The status of a nonactor argument varies. A nonactor argument realizes a structure participant when a complex event verb has a two-participant root, and it realizes a pure root participant when a simple event verb has a two-participant root. This difference indicates a condition on the event structure-syntax mapping, referred to as The Structure Participant Condition: "There must be an argument XP in the syntax for each structure participant in the event schema" (Rappaport-Hovav & Levin, 1998a, p.113). This condition ensures that the mapping to syntax preserves facets of the event schemas. In many instances, this condition reduces to an alternative condition, The Argument-Per-Subevent Condition: "There must be at least one argument XP in the syntax per subevent in the event structure" (Levin & Rappaport-Hovav, 1999, p.4). It is due to the different nature of nonactor argument that the objects of simple and complex event verbs show different properties. To illustrate, surface contact verbs (e.g., *wipe*, *rub*, *scrub*, *sweep*) and COS verbs (e.g., *break*, *dry*, *melt*, *open*) are both transitive verbs associated with two-participant roots, but due to distinct root types (manner vs. result), they have distinct event schemas. As a result, surface contact verbs show more argument realization options than COS verbs (Rappaport-Hovav & Levin, 1998a; Wright & Levin, 2000). For instance, unlike COS verbs, they allow unspecified objects, as in (10) and nonsubcategorized objects, as in (11).

(10) Unspecified Objects
a. Leslie swept/scrubbed (the floor).

b. *Kelly broke again tonight when she did the dishes.

(11) Nonsubcategorized Objects

a. Leslie wiped the cloth over the table. (Means ‘Leslie wiped the table’)

b. Kelly broke the stick over the fence. (Cannot mean: ‘Kelly broke the fence’)

(Levin, 2009, II, p.12)

This difference in behavior is due to the different nature of nonactor arguments in the event structures of these verb classes. A surface contact verb is a manner root verb; it has simple event schema with only one structure participant, the actor. Only this argument is required by the Structure Participant Condition. Its object, a nonactor argument, is a pure root participant and does not fall under this condition. Consequently, it can be left unexpressed, giving unspecified object interpretation, and there is no reason for object to have consistent semantics. In contrast, a COS verb is a result root verb; it has complex event schema with two structure participants; it must have two syntactic arguments required by the Structure Participant Condition. Its object must realize the structure participant of the second subevent. Consequently, it has specified objects, and fixed choice and interpretation of object: gets uniform semantics (patient), determined by its event schema position.

Levin and Rappaport-Hovav (1995) propose four linking rules formulated in terms of internal and external causation pertinent to argument realization.

1. *Immediate Cause Linking Rule*
   The argument of a verb that denotes the immediate cause of the eventuality described by the verb is its external argument. (p.135)
2. *Directed Change Linking Rule*
   The argument of a verb that corresponds to the entity undergoing the directed change described by that verb is its direct internal argument. (p.146)
3. *Existence Linking Rule*
   The argument of a verb whose existence is asserted or denied is its direct internal argument. (p.153)

4. *Default Linking Rule*

   An argument of a verb that does not fall under the scope of any of the other rules is its direct internal argument. (p.154)

To sum up, in the event structural approach to verb meaning elaborated above, event schema and root are two aspects of verb meaning's internal structure. The former represents the structural part and determines the verb's membership in a class, while the latter represents the idiosyncratic part and distinguishes the verb from other verbs in the same class. The intuition behind this approach is as observed by Beavers and Koontz-Garboden (2017): "[C]ertain conceivable verb meanings are precluded by combinatoric rules for deriving possible event structures, thus ruling out particular argument structures and aspectual properties with verbs that have particular meanings" (p.843). To illustrate, as pointed out by Beavers and Koontz-Garboden (2012), only an individual or an action, not a change of state, can be a causer argument of a primitive predicative CAUSE. This predicts the nonexistence of a verb *grimp* meaning 'x dying caused y to die', since the corresponding event structure [[x BECOME <dead>] CAUSE [y BECOME <dead>]]] is impossible.Only grammatically relevant lexical meanings have syntactic effects, and the identification of such meaning components requires a thorough examination of a phenomenon in the context of the overall grammatical organization of a language, by focusing on how its components interrelate. The following section presents the assumptions this study adopts about the syntactic side of the lexical semantics-syntax interface.

2.2.2 Syntactic Representation

As to the syntactic side of the lexical semantics-syntax interface, this study adopts most of the principles and assumptions[10] that Jackendoff (2002), and Culicover and Jackendoff (2005)

[10] The present study differs from Simpler Syntax model in three main ways. First, it adopts, in place of Conceptual Structure, Rappaport-Hovav and Levin's (1998a) root-event schema-based event structure account, as detailed in section 2.2 above. Second, it makes distinction between lexical semantic structure and conceptual structure, as observed by Evans (2009). For instance, linguistic content encodes knowledge in parametric fashion, that is, it

propose under the Parallel Architecture and Simpler Syntax account of sentence structure. The choice for this account was made on the observation that Urdu, as mentioned in Chapter 1, has a 'flat' structure in the sense defined in this account. Simpler Syntax argues for flat syntactic structure over ramified structure which assumes "hidden levels" motivated by theoretical principles aiming at structural, interface and derivational uniformity rather than empirical facts. Also, this account argues for a rich syntax-semantics interface which helps avoid unnecessary complexity in structural components of phonology, syntax and semantics. The relevance and implications of this theoretical framework become clear during the course of data analysis. This syntactic account is premised on the Simpler Syntax Hypothesis (SSH): "The most explanatory syntactic theory is one that imputes the minimum structure necessary to mediate between phonology and meaning" (Culicover & Jackendoff, 2005, p.5). It means that many linguistic phenomena involve semantic/pragmatic factors which resist suitably general syntactic derivation for a uniform coding into a reasonable syntactic level. No complications are necessary in syntax if such cases are accounted for in terms of syntax-semantics interface.

This study assumes that language comprises a number of independent generative systems (phonology, syntax and semantics, with the possibility of further subcomponents) aligned with each other through interface systems. Structures in different components are made of different sorts of "stuff" and it is not possible to derive one component's combinatorics from another component via transformations without complicating one or the other component. What is required is a constraint-based system to coordinate various types of structures. A sentence is well-formed if each part of each structure is licensed and each connection between parts of the

---

represents the complexity of multimodal experience not in terms of richly inflected nuances but in terms of much broader distinctions (parameters); it is so highly schematic in nature that it is non-analogue: it takes a format that is not analogous to the multimodal experiences that it is a schematization of. Third, it avoids the notions of thematic and grammatical function hierarchies, and resorts to event geometry to formulate mapping between various levels of linguistic representation. However, it concurs with the overall insight of Simpler Syntax Hypothesis.

parallel structures is licensed by an interface constraint. Syntax mediates between the linearly ordered phonological string of words and the highly hierarchical but linearly unordered structure of meanings. Language thus provides sound-meaning mapping by independently characterizing sound, syntax, and meaning, and using the interface components to map between them.

Lexical items serve as interface rules to establish the correspondence of certain syntactic constituents with phonological and semantic structures, as shown in (12) below. In addition to a lexical item's overt content, it may have contextual features in any of the three domains, which stipulate what must appear in the item's environment.

(12) Sem: [admi; bur^{h}a]

Syn: [$_{NP}$ Adj N]

Phon: bur^{h}a admi 'old man'

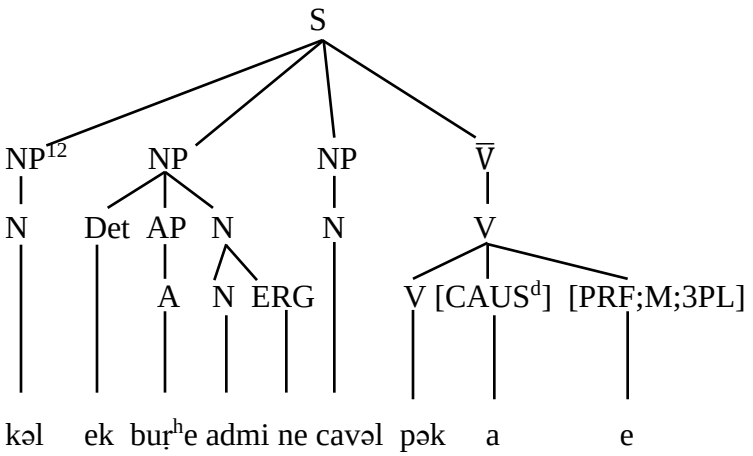
Morphology works below the word level (see Jackendoff & Audring, 2020 for Relational Morphology based on the Parallel Architecture). Morphophonology deals with the phonological structure of words from stems and affixes, for instance, how the sounds of stems and affixes influence each other. Morphosyntax deals with syntactic structure inside words, for instance, the syntactic category that an affix applies to and the syntactic category of the resultant formation. Morphosemantics concerns the range of meanings that can be expressed morphologically. Many productive affixes (e.g., the regular plural in English and causative affixes in Urdu-Hindi) can be treated as lexical items that provide an interface between pieces of phonology, syntax, and semantics below the word level. Thus, morphology is a generative system in its own right.

In Simpler Syntax, syntax is relatively flat: linearly ordered headed phrases correspond to constituents in Conceptual Structure[11], but not more. Syntactic structure is a linearized

[11] As mentioned earlier, the present study differs from Simpler Syntax's conception of Conceptual Structure. Following Evans (2009 and references therein), it assumes a distinction between conceptual representation and

hierarchical tree structure whose nodes consist of syntactic features of lexical items, such as grammatical category, number, and gender. (13) below illustrates an Urdu syntactic structure.

(13) A direct causative sentence in Urdu



yesterday an old man ERG rice cook CAUS[d] PRF.M.3PL
'Yesterday an old man cooked rice.'

Following Mohanan (1994) and Butt (1995), we use $\overline{V}$, instead of VP, to represent the non-configurational character of Urdu-Hindi in which the status of VP node is not stable to capture subject/non-subject asymmetry in terms of categories (see Mohanan, 1994). The structure in (13) above is flat in the sense that there is no hierarchical distinction in the NPs between the attachment of the Det and the other complements and adjuncts, and the adjunct is likewise a sister of $\overline{V}$ and the argument NP.

The core insight of X´ theory is retained: a phrasal node typically has a unique lexical node as its head; all its other dependents are either phrasal or minor categories. There is no phrasal adjunction (XP dominating XP plus an adjunct); inflectional affixes are adjoined at the X^o level. Thus, the phrasal schema is only one layer deep with one exception, the projection of V, where in English there seems justification for an additional layer of structure: V dominated by

---

semantic representation in that the former is far too rich, but the latter is schematic and specialized for being encoded in language. However, semantic structure facilitates access to conceptual structure.

[12] For the phrasal status of *kəl* 'yesterday' as an NP, see Huddleston & Pullum (2002, pp.564–565).

VP dominated by S. The terminal nodes of a syntactic structure are chosen from the set of X^o categories N, V,A, P, Q, Adv, Det, M, etc., plus various affixal categories that consist of complexes of grammatical features such as plurality, case, gender, agreement, tense and aspect. Unlike the major lexical categories N, V, A, P, and Adv, the minor categories such as Det and Modal do not (generally) have phrasal nodes. Phrase structure rules are taken as constraints on possible structures rather than as rewriting rules. Some of these are universal in character, but some are peculiar to a language. The phrase structure rules can divide into constituency rules (constraints on constituency) and linear order rules (constraints on linear order). This offers an advantage in dealing with free word order phenomena since constituents can be arranged in different ways without affecting hierarchical structure. In a free phrase order language, the autonomous linear order rules are either absent or default. In such a language, any strong constraints on linear ordering are provided by phrasal interface rules. For bringing syntax close to meaning, no hidden levels of syntax are needed to relate to overt syntax by movement, insertion, and deletion. The positional change of a constituent from position X to position Y is accounted for in terms of interface principles. Such a formulation of positional alternation avoids syntactic complexity. However, a second level of syntax called "Grammatical Function tier" is posited that proves necessary to implement the mapping between syntax and semantics.

This study capitalizes on the key assumptions of root-event schema-based event structure on the semantic side of the lexical semantics-syntax interface, and Simpler Syntax assumptions on the syntactic side of the interface to account for various facets of the causative alternation. The next section reviews various current approaches to the causative alternation as well as the previous work on Urdu-Hindi causatives.

2.3 The Causative Alternation

The causative alternation is a transitivity alternation which involves verbs with both transitive and intransitive uses where the transitive use of a verb V can be paraphrased as roughly 'cause to V-intransitive' (Levin, 1993; Levin & Rappaport-Hovav, 1994, 1995). In the transitive and intransitive sentence pair in (14) below, the transitive sentence *Pat broke the window* might be paraphrased as *Pat caused the vase to break*. It follows that the causative alternation permits both causative and anticausative (inchoative) construals (Alexiadou, 2010) since both variants show a significant overlap in meaning (Levin, 2015a). That is, the causative variant describes a change of state and the cause argument is expressed as a subject, while the patient/theme argument is expressed as a direct object. The anticausative variant also describes a change of state but does not express the cause argument; the sole argument, patient/theme, is realized as a subject. A central characteristic of this transitivity alternation is, therefore, that the subject of the intransitive variant and the object of the transitive variant bear the same semantic relation to the verb (Bhatt & Embick, 2004; Levin & Rappaport-Hovav, 1995; Schafer, 2009). (14) and (15) below represent the alternation in English and Urdu respectively:

(14) English

a. The window broke. (Anticausative)

b. Pat broke the window. (Causative)

(Levin & Rappaport-Hovav, 1995, p.79 (1a))

(15) Urdu

a. kʰɪɽki ʈuʈ-i (Anticausative)
window.F.3SG break-PRF.F.3SG
'The window broke.'

b. ɪzza=ne kʰɪɽki toɽ-i (Direct causative)
izza.F.3SG=ERG window.F.3SG break.CAUS^{d}-PRF.F.3SG
'Izza broke the window.'

c. ɪzza= ne aɪʃa=se kʰɪɽki təɽ-va-i (Indirect causative)
izza.F.3SG=ERG aisha.F.3SG=INST window.F.3SG break-CAUS^{ind}-PRF.F.3SG
'Izza had Aisha break the window.'

In both (14) and (15), the intransitive variant describes the patient participant (the window/k^hɪɾki) undergoing a change of state, becoming broken, and the transitive variant describes the causation of this state. The subject of the intransitive variant and the object of the transitive variant bear the same semantic role, despite the fact that English verb *break* has two morphologically identical variants whereas Urdu counterpart of *break* shows three variants morphologically related but not identical. Though languages differ in the formal encoding of causative alternation (Haspelmath, 1993), the productivity of the alternation is established within and across languages (see Levin, 1993 for English verbs). Besides cross-linguistic variation, however, causative alternation also involves variation within a single language in that members of a semantically identifiable verb class well-attested in the alternation may behave differently.

Although the causative alternation is productive, it is also constrained. For instance, COS verbs typically alternate, as in (14 & 15) above. However, there are COS verbs which can only occur as intransitives and do not form causatives, as in *The cactus bloomed early/*The gardener /The warm weather bloomed the cactus*, or as transitives and do not form anticausatives, as in *The terrorist assassinated/murdered the president/ *The president assassinated/murdered* (Rappaport-Hovav, 2014a). There are also verbs which in principle alternate, but for certain choices of arguments appear not to alternate (Alexiadou, 2010; Levin & Rappaport Hovav, 1995; Rappaport-Hovav, 2014a). For instance, the verb *clear* shows the alternation, as in *I cleared the screen*/*The screen cleared*, but it does not have anticausative variant for one particular choice of theme argument as in *The waiters cleared the counter*/**The counter cleared*. The contrasting behavior of COS verbs shows that the presence of 'cause' and 'change' as meaning components may be necessary but not sufficient conditions to ensure verbs' participation in the alternation. It means some other factors besides 'cause' and 'change' must be found to explain the divergent

behavior of COS verbs. More specifically, the account needs to answer questions such as: Are deviant cases arbitrary exceptions to the productive pattern? If not, are they predictable based on certain criteria? Moreover, a causative alternation verb is generally assumed to have only one lexical entry and that its variants are derivationally related. However, the theories differ on which variant is basic, and where in the grammar such lexical derivation takes place.

As to the location of derivation, theories divide into lexicalist and syntactic accounts. Lexicalist accounts assume that a verbal lexical entry comprises not only idiosyncratic but also structural facets of verb meaning, as discussed in section 2.2.1. Certain lexical operations work on lexical entries in order to derive argument alternations in the lexicon. The linking rules then map the verbal arguments onto different positions in the syntactic structure (see Levin & Rappaport-Hovav, 1995). In contrast, syntactic accounts restrict a lexical entry to its core idiosyncratic meaning, and all structure changing effects to the syntax. Argument alternations occur when a lexical root is inserted in different syntactic environments (see Borer, 2005).

As to the direction of derivation, Schafer (2009) classifies the accounts of the causative alternation into three subclasses: Intransitive base, Transitive base and Common base.

2.3.1 Intransitive base approaches.

In these approaches, a causativization process is assumed to derive the transitive variant from the intransitive base. In lexicalist theories making such an assumption, causativization adds a CAUSE predicate to the lexical representation of the anticausative base. In Hale and Keyser (1986), for instance, the causativization embeds the lexical conceptual structure of intransitive *break* under a CAUSE predicate introducing the external argument: [become *BROKEN* (x)] → [(y) cause [become *BROKEN* (x)]]. Koontz-Garboden (2007) also takes the noncausative variant to be basic under his Monotonicity Hypothesis: “Word formation operations do not remove

operators from lexical semantic representations" (p.25). Since such an approach adds rather than deletes an element of meaning, it subsumes the meaning of the noncausative variant under the causative variant. In the syntactic version of the causativization analysis, verbs are syntactically decomposed into different verbal layers expressing subevents. The presence of a verbal layer projected by a CAUSE head that introduces the external argument results in the causative variant (Folli, 2003; Folli & Harley, 2005; Ramchand, 2008, among others). Ramchand, for instance, decomposes COS verbs into three verbal layers: *init*(iation)P, *proc*(ess)P and *res*(ult)P. The theme is first merged in the specifier of *res*P. Then it moves to the specifier of *proc*P and acquires a complex θ-role of both a resultee and an undergoer of the event. Causatives are derived by the addition of a default *init*-head expressing causation and introducing the external argument. However, causativization is restricted to account for the fact that not all COS verbs alternate. It is obligatory for necessarily transitive verbs, optional for alternating verbs and prohibited for non-alternating unaccusatives. Hale and Keyser (1986) and Ramchand (2008) take these kinds of restrictions to be of encyclopaedic nature coded in the lexical entry of a verb.

2.3.2 Transitive base approaches.

In these approaches, the anticausatives are derived from the causative base. These theories are lexical in nature, but differ on the derivation of anticausatives. Grimshaw (1982) assumes a detransitivization operation that deletes the CAUSE predicate from the lexical conceptual representation of the causative: Causative: [(x) cause [become BROKEN (y)]] → anticausative: [become BROKEN (y)]. Unlike Grimshaw, Reinhart's (2000, 2002) Theta System builds on feature decomposition rather than predicate decomposition. Theta roles are encoded by two binary features: [+/−c] and [+/−m]. The feature [+/−c] identifies whether the argument in question is responsible for causing the event, and the feature [+/−m] identifies whether the

mental state of the argument is relevant in the event. Thus, human agents are coded as [+c, +m], and themes as [−c, −m]. The coding [+c] is underspecified for [+/−m] and therefore compatible with both human agents and non-human causers. The anticausatives are derived from the causatives via reduction operation which reduces the external argument if it is [+c], that is, if it is underspecified for the contrast between agents, causers and instruments. If an unaccusative verb lacks a transitive counterpart, this transitive counterpart is taken as a 'frozen' category.

Levin and Rappaport-Hovav (1995) propose that all externally caused verbs (e.g., *break*, *dry*, *melt*) are inherently transitives and show the alternation, while all internally caused verbs (e.g., *bloom*, *blush*, *wither*) are inherently intransitive and do not show the alternation. A detranitivization process called 'lexical binding of the external argument' takes place when an externally caused verb can take agents, instruments or causers as external argument just like Reinhart's [+c] coding. To illustrate, in the transitive use of the alternating verb *break*, both arguments are first projected from its lexical semantic representation to argument structure through the mediation of linking rules, and then from argument structure to syntax. In its intransitive use, the external argument is lexically bound in the mapping from lexical semantic representation to argument structure and does not appear in the syntax.

2.3.3 Common base approaches.

In these approaches, both variants of the causative alternation are derived from a common base. Davis and Demirdache (2000) and Piñón (2001) propose a lexicalist version of this approach. Davis and Demirdache (2000) propose to derive all COS verbs from a causative event representation by a process of 'event foregrounding'. They use Pustejovsky's (1995) event structure representation, where all COS events are decomposed into a process (P) which causes a

change of state (T/S). In anticausatives, only T/S is foregrounded, whereas in causatives, both P and T/S are foregrounded. Only foregrounded events are syntactically realized.

A syntactic version of the 'common base' approach is often found within the framework of Distributed Morphology, which assumes that verbs are derived from category neutral roots by the addition of verbalizing heads (Alexiadou, Anagnostopoulou, & Schäfer, 2006; Embick, 2004; Pylkkänen, 2002, 2008). Roots are associated with encyclopedic knowledge which can restrict the syntactic frames a root can enter. Many syntactic theories assume the proposal by Kratzer (1996) that external argument is introduced not by (vCAUSE), the head introducing the causative event, but by Voice on top of vCAUSE. Causatives and anticausatives have the same number of events involved. Pylkkänen (2002, 2008) proposes that causatives and anticausatives involve the same root. However, anticausatives involve a BECOME projection, while causatives involve a CAUSE projection which directly combines with the root and which has a non-eventive Voice projection on top. Alexiadou, Anagnostopoulou and Schäfer (2006) reduce the number of syntactic heads in the decomposition and consider the causative alternation to be a Voice alternation, that is, causatives and anticausatives both involve the same event decomposition and differ only in the presence vs. absence of Voice introducing an external argument.

In contrast to Levin and Rappaport-Hovav's (1995) and Reinhart's (2002) transitive base analyses, Rappaport-Hovav (2014a) argues that there are certain cases which a dyadic base cannot account for. On Levin and Rappaport-Hovav's approach, the internally caused COS verbs (e.g., *blossom, flower, wilt*) are not, by hypothesis, expected to alternate. However, verbs in this class have been found with cause subjects specifying what Rappaport-Hovav refers to as ambient conditions, as in (16).

(16) a. *The farmer/* the new fertilizer blossomed the fruit.
b. Early summer heat blossomed fruit trees across the valley.

c. The onset of the temperature of 100 degrees or more, on top of the drought, has withered crops.

(Wright, 2002, p.341 as cited in Rappaport-Hovav, 2014a, p.13)

Such cases defy the accounts in Levin & Rappaport-Hovav and Reinhart. As internally caused verbs, they should not alternate as expected in Levin and Rappaport-Hovav. Although these verbs alternate as expected in Reinhart, they do not show the full range of semantic roles instantiating the external argument as characterized in Reinhart. These verbs undermine the claim that alternating verbs can be delimited on the basis of the transitive variant.

Another motivation for Levin and Rappaport-Hovav's (1995) transitive base position is their claim that the causative variant is always available in all cases of alternating verbs, but the anticausative variant is available only in a subset of cases. However, there are cases where alternating verbs lack natural causative variants, as in (17) and (18).

(17) a. The days lengthened into weeks.
b. ?The wait lengthened the days into weeks.

(18) a. My watch broke after the warranty ran out. (Most likely indicates cessation of functioning due to normal wear and tear)
b. I broke my watch after the warranty ran out. (wrong interpretation; this doesn't suggest that the watch broke from normal wear and tear)

(Rappaport-Hovav, 2014a)

Such cases indicate the need to formulate the precise conditions governing the nature and behavior of the cause argument. They further indicate that verb behavior defined in terms of internal and external causation is not relevant. This is the reason that Rappaport-Hovav (2014a) takes issues with Alexiadou, Anagnostopoulou & Schäfer's (2006) four-way lexical semantic classification of roots invloving internal and external causation:

a. Agentive: (like *murder*) never alternate across languages – they are always transitive
b. Internal causation: (like *blossom* and *grow*) never alternate across languages – they are always intransitive
c. External causation: (like *kill* and *destroy*) – do not alternate in languages like English which do not mark the alternation morphologically, but do alternate in languages like

Greek and Hebrew, in which the alternation is morphologically marked. In these latter languages, the intransitive variant is morphologically marked

d. Cause-unspecified: (like *break* and *open*) – alternate across languages: the suggestion is that when they are transitive they express external causation (as in (c) above) and when they are intransitive they express internal causation (as in (b) above).

(Alexiadou et al., 2006 as cited in Rappaport-Hovav, 2014a, p.19)

Rappaport-Hovav argues that the distinction between verbs denoting internally caused changes of state and externally caused changes of state is not grammatically relevant. Instead, she proposes a three-way distinction:

a. Verbs like *murder*, which specify something about the nature of the involvement of an external cause, are lexically associated with an argument representing the external cause, and this argument cannot be omitted
b. Verbs, like *kill* and *destroy*, which specify nothing about the nature of the causing event, but are nonetheless lexically associated with an argument representing the cause. Here, too, the argument cannot be omitted
c. All alternating verbs are lexically associated with the internal argument(s) only, namely, those involved in the specification of the nature of the change of state.

(Rappaport-Hovav, 2014a, p.21)

This account considers the external argument to be specified nonlexically and suggests an analysis in which nonlexical factors are appealed to in the distribution of the variants.

2.3.4 Previous work on Urdu-Hindi causatives.

Most of the earlier works on Urdu-Hindi causatives focus on the status and types of causatives and thus have missed many generalizations crucial to the analysis of causatives. In Kachru's (1966) Generative Semantics account, the earliest analysis of causativization in the generative tradition, all the three variants of a causative sentence, as in (15) above, are related by a process of successive embedding: the direct causative includes the noncausative as an embedding, and the indirect causative includes the direct causative as an embedding under an abstract causative node; an extra agent is introduced as a subject of the abstract verb CAUSE. Thus, the noncausative *break* occurs in the configuration [NP V], while its direct variant surfaces from [NP CAUSE [NP V]]. The embedded and the matrix sentences are subjected to a number of

transformations such as addition of auxiliary element, causativization of the verb in the embedded sentence and the addition of the object marker *-ko*. Unlike Kachru, Balachandran's (1971) Case Grammar analysis does not interpret the causatives in terms of embedding; rather, the difference is explained in terms of case relations: the noncauative variant has only the case category objective whereas the direct causative has an agent and an objective, and the indirect causative has an agent, a mediator and an objective. Thus, the causative has an extra agent in its case frame rather than as a subject of the abstract predicate CAUSE as in Kachru. Balachandran argues that the case frame analysis avoids the complexity of transformations and numerous constraints necessitated by the embedding under a CAUSE node to ensure correct derivations, and takes all variants as simplex sentences with no embedding. Balachandran proposes some specific rules for deriving the case frames for the causative verbs from the case frames of the noncausative verbs. For instance, the basic case frame of the verb *kʰa* 'eat' (A + O) can be employed to derive the case frame for the direct causative *kʰıla* (A + D + O) and that for the indirect causative *kʰılva* (A + IA + D + O). What is shared by these two accounts is the introduction of extra causative agent(s).

Saksena (1980), however, argues that causativization is not an agent insertion mechanism, but a foregrounding/backgrounding mechanism. She observes that almost all intransitive sentences can optionally take an agent in nonsubject position, marked by the instrumental case marking *se*. As a result, the intransitive and the transitive have the same number of arguments. Yet, the intransitives preserve their characteristic morphology, and continue to contrast with their corresponding transitive, as shown in (19) and (20).

(19) (raam-se) peer kat-aa
Ram-instr tree cut, Intr-past, m
'The tree got cut by Ram.'

(20) raam-ne peer kaat-aa
Ram-agt tree cut, Tr-past, m
'Ram cut the tree.' (Saksena, 1980, p.127)

Syntactically, the contrast between the intransitive and the transitive lies in subjectivisation. The intransitive subjectivises the patient, the transitive subjectivises the agent. Semantically, both the sentences express the same fact, that is, Ram cut the tree. However, the intransitive (19) is a statement about the tree being cut, whereas the transitive (20) is about Ram cutting the tree. Thus, only the transitive, but not the intransitive, attributes initiative to Ram. The intransitive-transitive pairs show that minimally, causative contrast is realized as subject contrast, not an extra agent contrast. The same holds for the transitive-causative pairs. Based on this, Saksena proposes a generalization: "[C]ausatives foreground an agent that controls the subject of the corresponding noncausative (where the syntactic realisation of foregrounding is subject status)" (p.129). Khokhlova (1997) also claims that the second causative does not always imply the addition of an extra agent to the case frame.

In contrast to lexicalist position in the studies reviewed so far, Bhatt & Embick (2004) analyze the causative constructions in Hindi within the framework of Distributive Morphology (Halle & Marantz, 1993) which assumes that there is no lexicon where the transitive verb is derived from an underlying intransitive one and vice-versa, and that the verbal alternation is syntactic in nature. It implies that transitivity or intransitivity refer to properties of the syntactic environment in which category-neutral Roots appear. There is no notion of 'syntactically basic configuration' for a Root because Roots do not determine these structures. Thus, the question about which variant of the causative alternation is 'basic' is considered irrelevant. However, Bhatt and Embick state semantico-syntactic directionality neither in terms of basic argument structure nor morphological patterns, but in terms of syntactic structures: "Structure (=features

arranged hierarchically) S is derived from structure S′ iff S contains S′ as a subcomponent" (p.30). The syntax/morphology interaction is covered under Strongest Interface Hypothesis: "All other things being equal, differences in morphological marking should correlate with syntactico-semantic (i.e. structural or featural) differences" (p.31). The causativization is taken to be an argument insertion mechanism and the semantics side of external argument licensing is assumed as is formalized in Kratzer (1996), that is, as DPs licensed in the specifier of a Voice head. The most basic component of cauastivization is the addition of the agent-licensing head ʊ[AG]. This analysis, however, does not address the question whether there are inherently different types of Roots capable of being interpreted out of the syntactically verbal environment and if so, how the semantics of roots and that of syntactic frame interact.

In contrast to Bhatt and Embick (2004/2017), Richa (2008), in her minimalist account, argues that Hindi transitives can be structurally divided into two types – those that have unaccusative as the base and the others that have unergative as the base. Only internally caused unaccusatives do not form transitives, hence no causatives. For the unergative class, the transitives cannot be derived by adding an external argument to the intransitive base as it can be done with the verb having an unaccusative base. Causativization, on the other hand, regularly adds a *se*-argument. She observes that there is a class of purely internally caused verbs, such as emission verbs (e.g., *ghurranaa* 'roar', *thartharanaa* 'tremble', *timtimanaa* 'twinkle'), non-volitional COS verbs (e.g., *khilnaa* 'bloom', *murjhanaa* 'wither', *su:jnaa* 'swell') and the verbs of existence, appearance and disappearance (e.g., *honaa* 'exist', *anaa* 'come', *khonaa* 'lose'), which display unaccusative behaviour, and have neither transitives nor causatives. This group remains unexplained under an analysis that holds transitivization as adding a v[AG] layer over an unaccusative base. The transitive of the unergatives cannot be derived from the intransitive base

structurally. It has to be a separate lexical entry. She observes that base unaccusatives show unergative behavior when their external arguments were animate. For example, though verbs of emission in Hindi behave as unaccusatives, vis-à-vis the use of the imperfective participle occurring with/without the genitive marker on the agent, they behave as unergatives if there is an animate agent:

(21) a. [badal (ke) garajte hi] vanja dar gaya
cloud GEN thunder-PRS.PTCP EMP Vanya scare go-PFV.F
'Vanya got scared as soon as clouds thundered.'
b. [sher * / ke garajte hi] bandar bag gaya
lion GEN roar-PRS.PTCP EMP monkey go away go-PFV
'The monkey went away as soon as the lion roared.' (Richa, 2008, p.151)

A similar pattern is observed with verbs of inherently directed motion and manner of motion. Thus Richa concludes that the specifier position of vP in Hindi is strongly constrained by the animacy requirement. Her analysis also concerns the (argument vs. adjunct) status of the causee, and the realisation of causative morphology, by which she proposes that the causative is a voice that introduces an event with a *se*-argument as causee.

The literature review of Urdu-Hindi causativity indicates that most of the research focuses on the semantic properties of the causatives and their derivation, and it lacks significant work on the contribution of event-based verb semantics to the causative alternation, as discussed above in section 2.2.1. The most recent literature (Bhatia, 2016; Bhatt & Embic, 2017; Ramchand, 2011, 2014), for instance, deal with *se*-phrase in Urdu-Hindi indirect causatives and the analysis is implemented in a syntactic approach. Since the focus of the present study is on morphological as well as semantic root, its primary interest lies in the licensing of *se*-phrase in anticausatives, the aspect of the causative alternation which has not been engaged with so far (see Chapters 4 and 6). Next section 2.4 deals with the implications for this study.

2.4 Implications for the Present Study

As mentioned earlier, most of the previous studies on the Urdu-Hindi causative alternation primarily concern the derivational directionality and argument insertion mechanism without systematically referring to the event structure and its relevance for verbs' behavior. An exception is the proposal in Ramchand (2008) which is a syntacticization of subevental relationships, as mentioned in section 2.3.1 above. Two main research gaps are, thus, obvious. First, no study has yet explored (a) the nature of the interaction between the grammatically relevant meaning components of the Urdu-Hindi (non)alternating verbs, and (b) the relevance of this interaction to the verbs' morphosyntactic behavior. Second, the main focus in the previous studies has been on the lexical factors, and the non-lexical factors have been overlooked. The following discussion intends to contextualize these research gaps.

As mentioned in Chapter1, despite the differences on the role of verb meaning in argument realization, both lexical and syntactic approaches recognize a distinction between the two facets of verb meaning: the idiosyncratic (root) and the structural (event schema) (Levin & Rappaport-Hovav, 2005). Understanding such building blocks and their interaction with the building blocks of other levels of linguistic representation can provide insight into the nature of language design. However, the main challenge is to make precise the nature of the root/event schema distinction and their respective roles in argument realization. To determine whether argument realization can be universally accounted for in terms of root/event schema distinction, empirical evidence needs to be generated on a language-by-language basis in that what is evidence for one language may not be evidence for all languages. The present study examines the nature of semantic roots and event schemas, and their respective roles in the causative alternation licensing in the Urdu COS verbs.

In addition to the lexically specified aspects of verb meaning, a comprehensive account of causative alternation verbs must also consider nonlexical factors governing the distribution of the variants (Levin, 2015a). As discussed above, Rappaport Hovav & Levin (2012) and Rappaport-Hovav (2014a) argue that all alternating verbs are lexically associated with the internal argument(s) only, namely, those involved in the specification of the nature of the change of state. What govern the nature and presence of the external cause argument for alternating verbs are not lexical factors, but nonlexical (contexual) constraints. In this connection, Rappaport-Hovav appeals to The Direct Causation Condition as proposed in Rappaport-Hovav and Levin (2012): "A single argument verb may be expressed in a clause with a transitive verb if the subject represents a direct cause of the event expressed by the verb and its argument" (p.160). While the variants of the causative alternation are not truth-conditionally equivalent, there is a relation of entailment between them. Since the two variants can in principle be used to describe the very same situation, the question then arises as to what variant is to be preferred in a given discourse context. Rappaport-Hovav argues that in the description of a change of state, the cause of the change of state is relevant; therefore, the transitive variant which specifies the cause and is thus more informative will be preferred over the anticausative variant, which expresses just the change of state, all things being equal. She argues that even though a corresponding causative is more informative, the anticausative is licensed under two conditions: (i) the cause is recoverable from context; (ii) the speaker does not know the cause. That is, some pragmatic licensing strategy is involved in the syntax-pragmatic coordination, whereby omitted morphosyntactic "elements are interpreted via discourse and not via syntactic operations" (Serratrice, Sorace & Paoli, 2004. p.184). As observed by Rappaport-Hovav, very little attention has been paid to the contextual factors governing the distribution of the causative alternation variants. "(G)enerative

grammarians have traditionally been concerned only with what forms are possible, not with the reasons for choosing among various grammatically well-formed alternatives"(Wasow, 2002, p.13). Likewise, Goldberg (1995) argues that felicity conditions for a given construction are a part of speakers' linguistic competence, and that "subtle semantic and pragmatic factors are crucial to understanding the constraints on grammatical constructions" (p.6). So for a holistic understanding of a linguistic phenomenon, both 'grammar' and 'usage' are to be included in the proper subject matter of linguistic theory. Such a theoretical consideration, as observed by Börjars (2006), stresses that explanandum is interpreted to be broader than the internal grammar and explanation must refer also to how internal grammar interacts with areas like pragmatics.

Assuming semantics as affecting syntactic structure (Levin & Rappaport-Hovav, 2005), and pragmatics as affecting syntactic choice (Allen, 2000; Huang, 2011, 2012), this study attaches a great significance to an integrated mode of explanation that draws on both lexical and nonlexical factors relevant to the causative alternation. However, its scope here is mainly limited to the lexical factors with respect to the Urdu causative alternation in the realm of COS verbs, the verb class which constitutes the core of the causative alternation verbs (Levin & Rappaport-Hovav, 1994; Schäfer, 2009; Wechsler, 2015). The study would touch on the pragmatic factors, if any, constraining certain aspects of the causative alternation. This study addresses the following questions with respect to the Urdu COS verbs' causative alternation:

1. Given the three morphological variants, which one is basic and which ones are derived?
2. How does the morphological structure relate to the lexical semantic structure?
3. How does a semantic root relate to an event schema in a verb's semantic representation?
4. How does a root-event schema-based representation map onto a syntactic representation?

These research questions instantiate a main concern in linguistics: the explicit characterization of grammatical knowledge. The questions and the sequential relation between them are based on

the architectural assumption that "The grammar consists of parallel generative components, stated in constraint-based form, each of which creates its own type of combinatorial complexity" (Culicover & Jackendoff, 2005, p.18). The first question takes seriously the morphological relations between the Urdu COS verbs' causative alternation variants and aims at the typology of morphological operations involved in the causative derivation so as to make explicit the basic/ derivative distinction, if any. The second question builds on the evidence from the first question and further explores the lexical semantic relations between the morphological variants in terms of lexical event structure. In event structure account adopted in this study, the semantic distinction between verbs' root and event schema components is central to understanding their syntactic behavior. Thus, deriving the syntactic properties of verbs from facets of their meaning requires an articulated lexical semantic representation of verbs and the mapping algorithm between semantic representation and the relevant syntactic representation. To meet this requirement, the third question is motivated by the semantic description of the design components of the Urdu COS verbs' lexical event structure. It aims at exploring how the design components – semantic root and event schema – go into the making of lexical semantic representation relevant for argument realization. After developing the lexical semantic representation based on semantic description of root/verb distinction, the next phase is the lexical semantics-syntax mapping. The fourth question deals with this phase and is about the nature of linking rules that generate such alternation. This question also addresses the problem of causality and seeks to explain why the alternating COS verbs in Urdu behave the way they do.

2.5 Conclusion

This chapter presents the theoretical background relevant for understanding the various aspects of the causative alternation as a lexical semantics-syntax interface phenomenon. It has critically reviewed various options for verbs' lexical semantic representation grammatically

relevant to argument realization, and provided motivation for adopting semantic root-event schema-based event structure as a theoretical apparatus to frame the lexical semantic side of the interface. As to the syntactic side of the interface, the Simpler Syntax assumptions relevant for this study have been briefly presented. The chapter has also motivated the present study's research problems after reviewing various approaches to the causative alternation and previous work on Urdu-Hindi causatives. The next chapter elaborates the methodological choices considered significant for the empirical study of the Urdu COS verbs' causative alternation.

Chapter 3

Methodological Considerations

The present study explores the factors licensing the Urdu COS verbs' causative alternation. The research questions are repeated here for immediate reference: (a) Given the three morphological variants, which one is basic and which ones are derived? (b) How does the morphological structure relate to the lexical semantic structure? (c) How does a semantic root relate to an event schema in a verb's semantic representation? (d) How does a root-event schema-based representation map onto a syntactic representation? For addressing these research questions, the linguistic evidence required cannot be accessed directly because the object of inquiry – a native speaker's linguistic competence – is tacit in nature (see Edger, 2003). It must be, therefore, reconstructed from the accessible manifestations of linguistic behavior (data) (Kepser & Reis, 2005). Thus, linguistic theorizing is bound up with reliable empirical evidence. Considering a crucial relation between the reliability of evidence and the adequacy of theory, this chapter lays out the research methodology to address the research problems stated above. Section 3.1 presents rationale for overall research design. Section 3.2 deals with the nature of data and its sources. In section 3.3, data analysis procedure is outlined. Section 3.4 concludes the chapter.

3.1 Research Design

To tap into native speakers' intuitions about COS verbs' semantics, morphology and syntax, the first requirement is the descriptive data in the form of COS verbs and their example sentences. And to ascertain the nature of COS verbs' lexical semantic representations as well as the semantics-syntax mapping algorithm, the second requirement is the inductive analysis of the descriptive data. To meet these requirements, qualitative research design is deemed relevant

because in it, “the abstractions are built as the particulars that have been gathered are grouped together” (Bogdan & Biklen, 2007, p.6). In addition, qualitative design ensures an in-depth analysis of the phenomena through a particular focus on text (Leedy & Ormrod, 2013; Miles & Huberman, 1994; Myers, 2009; Onwuegbuzie & Leech, 2005), and being flexible, it can accommodate new linguistic details emerging during the process of investigation (Dörnyei, 2007). In terms of inquiry mode, the present study is primarily a qualitative case study because it explores the nature, not the extent of the research problem (Kumar, 2011), and ensures the intensive analysis of the bounded system (Hancock & Algozzine, 2006). The bounded system in this study is the phenomenon of causative alternation in the Urdu COS verbs. The types of questions raised in the present study are also appropriate for a case study research as suggested by Yin (2003), and Gay, Mills and Airasian (2012). Though it is a case study, the conclusions based on the extensive data and the context of the case, as pointed out by Bogdan & Biklen (2007), might be generalizable to other similar cases. Despite the overall qualitative character of the study, a particular aspect of the research problem is quantified where quantitative evidence is considered necessary. For instance, the data collected from lexical resources (WordNet and Urdu Lughat) and experimentation is subjected to descriptive statistics for frequency count of verbs’ behavior (see Wasow & Arnold, 2005) because the use of statistics helps “evaluate the likelihood of particular hypotheses” (Gibson & Fedorenko, 2013, p.92).

As to theory development strategies (Meleis, 2012), this study adopts theory-to-research-to-theory strategy in that its research questions are framed within a particular theory of argument realization proposed by Rappaport-Hovav and Levin (1998a), and that its research findings might, in return, inform and develop the theory. As observed by Meleis, the process used for theory-to-research-to-theory strategy includes (a) a theory is selected that is compatible with the

domain of research to explain a phenomenon, (b) theory concepts are redefined and operationalized for research, (c) findings are synthesized and used to modify, refine, or develop the original theory, and (d) in some instances, the result may become a new theory. The present study considers this theory development process from problem statement to research findings. Chapters 4–6 build on the theoretical base step by step from morphological evidence to linking algorithm, making suggestions along the way for the original theory.

3.2 Data Collection

3.2.1 Data: Change of state (COS) verbs.

The epistemic interest of this study concerns only the COS semantic domain, the reasons for which are as follows. That every human language possesses the means to express the notion of causation indicates the fundamental nature of this cognitive category (Shibatani, 2002). Among the lexical means to express causation, COS verbs are attested as a core lexical semantic class (Levin, 1993). Consistent with this, COS verbs have figured prominently in recent discussions on lexical semantics-syntax interface: COS verbs' causative alternation has played a central role in argument realization theory (see Levin, 1993; Levin & Rappaport-Hovav, 1995; Rappaport-Hovav, 2014a; Richa, 2008; Schäfer, 2008). Despite the ubiquity of COS verbs in languages, however, there does exist cross-linguistic diversity in COS verbs' semantics and morphosyntax. For example, the inchoative version of the transitive verb *cut* does not exist in English but is available in Urdu (Raza, 2011). Thus, such a basic cognitive category as causation and such a core semantic type as COS verbs together make an ideal focus for investigation leading to the study of both language universals and cross-linguistic variation.

The COS semantic type examined in this study includes only "verbs lexicalizing a change of state" (Rappaport-Hovav & Levin, 2005, p.276). A COS verb in its basic meaning denotes an

event[13] in which "the structural integrity or configuration of the object changes over the course of the event" (Croft, 2012, p.326). Despite the fact that COS verbs have been considered a grammatically-definable semantic verb class, "It hasn't been clear which verbs truly are members of the change of state class, in part because it has been difficult to pinpoint the semantic criteria and the syntactic alternations which characterize these verbs" (Wright, 2001, p.4). As a result, what it means, semantically as well as syntactically, to be a COS verb is still an open question. In his event representation, Dowty (1979) describes COS verbs in terms of BECOME operator which he defines truth conditionally as:

> [BECOME ϕ] is true at *I* iff (1) there is interval *J* containing the initial bound of *I* such that ¬ ϕ is true at *J*, (2) there is an interval *K* containing the final bound of *I* such that ϕ is true at *K* and, (3) there is no non-empty interval *I'* such that *I'*⊂*I* and condition (1) and (2) hold for *I'* as well as *I*. (p.141)

Dowty's analysis makes general distinction between verbs which involve the notion of change (e.g., *kill*, *notice*, *walk*, etc.) and which do not (e.g., *know*, *love*, *sit*, etc.), but it could not define COS verbs as a semantically precise verb class. In contrast, Fillmore (1970) defines COS verbs as a subset of verbs which "assert that the object identified by the X element is understood as undergoing some kind of change of state. That is, the X element is understood as essentially different after the event symbolized by the verb "happened" to it" (p.130). That is, COS verbs "assert of an object a change in time from one "state" to another" (p.131).Though specified, Fillmore's description too leaves inexplicit the notions of "state" and "essentially different". In comparison to Fillmore's, Levin's (1993) description, however, is more specific and elaborated.

[13] This work adopts Maienborn's (2011) ontological definition of event: "Events are particular spatiotemporal entities with functionally integrated participants" (p.808). Given the functional integration of participants, events can vary in the way they are realized. Several ontological properties follow from it. As concrete spatial entities, events are perceptible; due to their spatiotemporal extension, they have a location in space and time; since they are particulars, they have a unique manner of realization (Maienborn, 2019).

She subclassifies COS verbs into six semantic subsets – *Break* Verbs, *Bend* Verbs, *Cooking* Verbs, Verbs of Entity-Specific Change of State, Verbs of Calibratable Change of State and Other Alternating Verbs of Change of State. In her analysis, the *Break* Verbs (e.g., *break, crack, shatter*, etc.) describe a change in the material integrity of some entity, whereas the *Bend* Verbs (e.g., *bend, crease, fold,* etc.) denote a change in the shape of an entity without disrupting its material integrity. The *Cooking* Verbs (e.g., *cook, bake, boil*, etc.) describe various ways of cooking food, and the Entity-Specific Change of State Verbs (e.g., *bloom, corrode, rot*, etc.) describe change of state specific to particular entities. The Verbs of Calibratable State of Change (e.g., *balloon, climb, soar*, etc.) describe changes in measurable entities along a scale. Finally, Levin presents a miscellany under Other Alternating Change of State Verbs (e.g., *clean, acidify, accelerate,* etc.) which denote changes in a physical state mainly due to an external causation. Levin also mentions the syntactic environments in which these verbs occur (e.g., causative and middle alternations) or do not occur (e.g., conative and intransitive locative alternations).

Although Levin classifies COS verbs as a distinct and coherent verb class due to their shared semantic and syntactic behavior, her subclassification lacks a comprehensive and a fine-grained ontology of COS types, which may help identify the grammatically-relevant meaning components defining the interaction, on the one hand, between a verb's meaning components themselves, and on the other hand, between a verb's meaning and its syntactic behavior. Such an ontology of COS types can also help to articulate the semantic aspects of COS verbs which may otherwise be left unarticulated such as the question whether position/location of an object is as relevant part of its state as volume is. Such semantic aspects of COS verbs may include the sorts of things included on Pustejovsky's (1995) Qualia Structure: part/whole relationships, information about shape, color, dimension, orientation, origin, function, and so on. Thus, to

characterize the COS verb class more precisely, such gaps need to be filled. In this regard, Doering's (2015) ontology of COS types in English, as given in Table (3.1) below, is relevant, which is largely motivated by Dixon and Aikhenvald's (2006) semantic types of adjectives.

Table 3.1

Attributes and result values for change of states

COS Type	Attribute	Result Value
Dimension	size, length, volume, thickness	changes, increases, decreases, specific
	shape	changes, specific (cylindrical, flat, etc.)
Color/Texture	color	appears, disappears, changes, mixes, separates, specific, (becomes, green, red, etc.)
	texture	changes, specific (slippery, frothy, bubbly, soft, etc.)
Physical	weight	increases, decreases
Property	flavor, smell	changes, intensify, specific
	solidity	liquefies, solidifies, specific (paste, soggy, etc.)
	wetness	becomes wet(er), dry (er)
	visibility	appears, disappears
	temperature	increases, decreases
	containment	becomes filled, emptied, hollow
	surface Integrity	a whole or opening appears
Quantification	number of pieces	increases, one becomes many decreases, many become one
Position	location	changes, enter/exit container, specific
	occlusion	becomes covered, uncovered
	attachment	becomes detached
	presence	no longer present, becomes present

Such ontologies may contribute to our understanding of what attribute-value matrices are lexicalized by verbs and how they are relevant for determining their syntactic potential. For instance, more recently, Rappaport-Hovav and Levin (2010) describe COS verbs as "result verbs" as they "specify the coming about of a result state" (p.21), not the manner of action. Being a result verb, a COS verb lexically specifies a change in values along a property scale, "where a scale is a set of degrees – points or intervals indicating measurement values – on a particular dimension (e.g., height, temperature, cost), with an associated ordering relation"

(p.28). In contrast, Beavers and Koontz-Garboden (2012) argue that there are COS verbs such as *manner of killing* and *cooking* verbs that encode both manner and result meanings. Such variability in COS verbs' lexicalization patterns are more likely to lead one to what Evan (2009) calls a word's semantic potential, complex conceptual content to which a word facilities access, and thus, poses a challenge to an explicit semantic classification of verbs in general. To meet such challenges, fine-grained ontologies based on attribute-value matrices like the one given above can play significant role, by making deep-dive analysis of lexical meaning. Also, such an ontology of COS verbs helps define the notion of "causal responsibility' discussed in Chapter 4.

The present study concerns COS verbs' grammatically-relevant semantic properties in the manner of Fillmore (1970) and Levin (1993); however, it also explores how various attribute-value matrices lexicalized by COS verbs (root components) interact with their event schemas and affect their potentiality to participate in the causative alternation. To be more specific in the treatment of COS verbs in this work, therefore, the domain of concrete COS events, as opposed to abstract events, was taken centrally to include the kind of events which entail a specific change in an entity's perceptible properties such as appearance, dimension, surface integrity, texture, color, odor, temperature, solidity, density, and so on (Doering, 2015; Levin, 1993). To establish a more focused empirical data base for 'pure' COS verbs, not just change verbs in general, and to ensure data validity, the verbs expressing a change of position/location but not a change in any one of the attributes mentioned above were not included in the data set. The data set under study, thus, did not include the "Move" members of Jesperson's (1914–29/1961) "Move and Change" class. The core semantics of COS verbs (both alternating and non-alternating) as assumed in this study is as in (1) below and a COS verb may assume logical form (2a) only, or (2b) only, or both of them alternatingly, as given in (2).

(1) An event participant *Y* undergoes a change in some observable property or transforms into something else irrespective of whether the event participant *X* causing the change in *Y* is obvious or not.

(2) a. [BECOME [Y <*STATE*>]]

b. [[X ACT] CAUSE [BECOME [Y <*STATE*>]]]

(2) above accommodates both senses of COS verbs: (a) "come to be in state" and (b) "cause to come to be in state", as noted by Levin and Rappaport-Hovav (1991). In (1), the underlying assumption is that what, in the normal course of events, is physically affected is salient (see Dixon, 2005). So it is the change in the state of argument *Y*, not the cause argument *X*, that most saliently defines an event as a COS event and a verb describing that event a COS verb, although the nature of that change differs across events and thus, across verbs. However, explicit or not, the cause associated with COS events remains cognitively, if not linguistically, present (see McKoon & Macfarland, 2000). Their psycholinguistic experiments suggest that the cause referent in the causing subevent is part of the resulting subevent because both transitive and intransitive uses share the same conceptual representation.

The relevance of the patient Y in defining COS verb class also finds support in unsystematic polysemy, as in (3):

(3) a. cavəl pək-e
Rice.M.3PL cook-PRF.M.3PL
'The rice cooked.'

b. am pək-e
mango.M.3PL cook-PRF.M.3PL
'The mangoes ripened.'

c. pʰɪnsi pək-i
pimple.F.3SG cook-PRF.F.3SG
'The pimple softened.'

Though situations described in (3) above are connected by relation of similarity due to a shared lexical meaning of the Urdu verb *pək* 'cook', what is crucial is the fact that *pək* exhibits meaning variation (idiosyncratic) triggered by different properties of patient arguments. The overt linguistic encoding of cause arguments would not make any significant addition to the core semantics of this COS verb. As argued by Marantz (1984) and Kratzer (1996, 2004), internal (patient) arguments give rise to meaning variation more than external (cause) arguments. As mentioned in Chapter 2, Rappaport-Hovav (2014a) also observes that most of the COS verbs and "All alternating verbs are lexically associated with the internal argument(s) only, namely, those involved in the specification of the nature of the change of state" (p.21)[14].

The patient argument's predominant involvement in a COS event semantics is explicitly evident in Kalam (an East New Guinea Highlands language) in which one, while reporting complex events such as *break*, *split*, *sever*, etc., cannot say, for example, "that 'something broke X'; one must say 'something happened to X and it broke'" (Pawley, 2011, p.15).

(4)

	kab	añañ	ap	yap	pkek,	pagak	ok
KAL	stone	glass	come	fall	it:having:struck:DS	it:broke	that

'A stone fell and struck the glass and it broke.'

(Pawley 1987, p.355 as cited in Bohnemeyer et al., 2011, p.55)

Due to its central role in an intra-event causal relation, a patient argument carries more information than cause argument in COS domain. That is, patient argument prototypically supplies much of the relevant information; for instance, it is not possible in the act of breaking to place the patient (what is broken) into the background of attention unless there is some pragmatic reason to shift attention toward the action of breaking, and therefore away from the patient

[14] Despite an asymmetry in the semantic contributions of external and internal arguments, the present study does not entirely severe external argument from the COS verb semantics in that it assumes the notion of causal responsibility (to be discussed in Chapter 4) which is either encoded in the COS verb semantics, or the COS verb semantics provides access to the conceptual structure level at which the casual responsibility among the event participants is originally conceptualized.

(Goldberg, 2001). This fact brings (1), our description of the core semantics of COS verbs, in line with Greenfield and Smith's (1976) Principle of Informativeness which suggests asymmetry in informativeness between event participants, that is, in terms of informational structure of an event, participant Y tends to have more informational value regarding COS than X which is often presupposed and generic. In frame semantics terminology, it means all COS verbs share the same basic profile (what is asserted: a change of state), but each differs in the particulars of the background frames (what is presupposed) (Croft, 1991; Goldberg, 2010; Langacker, 1987). To illustrate, *boil* and *melt* share the basic profile (state change) but differ in their background frames since the background frame of *boil* involves liquid (usually water), but the background frame of *melt* involves no such entity. To sum up, this work, however, does not take the definition of COS verb class as a closed matter as is the case with Saussurean sign; the definition adopted here is meant to serve the purpose at hand.

3.2.2 Data sources.

In line with the spirit of qualitative inquiry, the researcher himself served as a key instrument for collecting data (see Creswell, 2009). The researcher's mother tongue is Punjabi, more specifically the Maji dialect spoken in most parts of the province of Punjab, Pakistan; The researcher, however, believes that he is fully proficient in Urdu because he has been using it since the age of 5.6 when he got admission in class 1, and also because Punjabi is structurally close to Urdu. He has some knowledge of Arabic and Persian languages which are the two main sources of Urdu vocabulary. Moreover, as pointed out by Levin and Rappaport-Hovav (1995), for exploring the nature of interface between lexical semantics and syntax, subtle judgments about verb meanings are required to uncover the syntactically relevant components of verb meaning. Such judgments require the knowledge of language that goes beyond what most

dictionaries and reference grammars offer. For this reason, it is important to restrict the study of lexical semantic-syntax interface to languages a researcher is familiar with. The present researcher meets this requirement too, in understanding the relevant semantic nuances.

Contrary to Chomsky's (1965) view that "sharpening of the data by more objective tests is a matter of small importance for the problems at hand" (p.20), this study assumes that "Multi-source evidence can either validate the theory or bring contradictory results, therefore opening new perspectives" (Grisot & Moeschler, 2014, p.10). Therefore, the data collection process in this study is multistage and includes five main sources to explore the maximum space of grammatical possibility: lexical translation, Urdu WordNet, Urdu Lughat, individual and dialogical introspection, and experimentation.

3.2.2.1 Lexical translation.

First, a list of the Urdu COS verbs was prepared by carefully translating 369 English COS verbs from Levin (1993), the most comprehensive inventory of COS verbs in English, by using Qaumi English Urdu Dictionary, Government of Pakistan. It turned out that only 105 verbs out of Levin's 369-verb list could be translated into simple (one-word) predicates in Urdu. Out of the remaining 264 English verbs, most of them have complex predicates[15] as their Urdu equivalents, but some, compounds in particular, have no direct Urdu counterparts which, in the former case, indicates that Urdu favors a more analytic strategy and encodes in complex predicates the concepts which English squeezes into simple predicates, and in the latter case, indicates that Urdu lexical resources could not urdunize and circulate the new words in a timely manner in order to fill lexical gap between the source and target systems (see Saraireh, 2001). Since such translational gaps also indicate cross-linguistic variation in event segmentation in the

[15] Single COS verbs in English can be given quasi-isomorphic translations into complex predicates in Urdu in that the Urdu predicates specify the same conceptual elements and relations but package them in a more diffuse manner.

absence of a universal ‘event phrase’ (Bohnemeyer, Enfield, Essegbey, Ibarretxe, Kita, Lüpke, & Ameka, 2007), that is, the mapping between words and concepts within and across languages is neither exhaustive nor one-to-one, but may be one-to-many, many-to-one, or a mixture of these (Wilson & Sperber, 2012), much care was taken concerning the accuracy of lexical equivalence ensuring that both source (English) and target (Urdu) words denote the same or equivalent part of the extralinguistic reality, assuming that, as noted by Al-Jabr (2006), accurate translation presupposes accurate interpretation. In case of more than one translation option in Urdu, the choice was made, considering the denotative and connotative meanings of the choice, and the fact that exact synonymy rarely exists (Cruse, 1986; Murphy, 2010; Nida, 2001).

Since the empirical focus of this study is on simple predicates, only one-word lexical equivalents were included in the data list. To ensure such equivalence, verbs were cross-checked in different lexical resources. To ensure more rigor in the identification and translation process of COS verbs, the online versions of Oxford Dictionary and Merriam-Webster Dictionary were also consulted. Despite all that, it is not meant to imply that a total lexical equivalence has been reached because, as observed by Baker (1992), there may be subtle denotational differences due to cross-linguistic diversity in construal.

3.2.2.2 Urdu WordNet.

To further increase the amount of data, the next step was to review Urdu WordNet developed by Center of Language Engineering, University of Engineering and Technology, Pakistan. The choice was based on the assumption that a WordNet organizes lexical information in terms of word senses rather than word forms, and thus helps search words conceptually (Adeeba & Hussain, 2011; Ahmed & Hautli, 2011; Miller, Beckwith, Fellbaum, Gross & Miller, 1993); it also serves to map the sense boundaries of individual words before analyzing them in

their actual uses (Keith, Lascarides & Calder, 2006; Murphy, 2007). For exploring the event-related properties of verbs, one also needs to see them in their actual use because example sentences illustrate verbs' morphosyntactic behavior (Lehmann, 2004). In this connection too, a WordNet provides example sentences for different word senses, which can be used as a usage-based support for mapping out the alternative realizations of a linguistic entity (Talmy, 2007), say, the causative and anti-causative coding tendencies of verbs (see Haspelmath, Calude, Spagnol, Narrog & Bamyac, 2014). In view of the advantages a WordNet presents, Urdu WordNet was closely examined. Out of total 5138 entries in its data base file, 1270 verb entries were manually identified, and after data cleansing, only 67 COS verbs measured up to the COS criterion elaborated in section 3.2.1. The variants of alternating COS verbs were also found missing or listed as different entries in their own right. As pointed out by Gilquin (2010), the absence of a particular form from a corpus cannot be taken as an evidence for its non-existence, more particularly when it is not adequate in size and scope. These limitations in Urdu WordNet led to Urdu Lughat, the largest dictionary in Urdu to date.

3.2.2.3 Urdu Lughat.

Urdu Lughat is a 22-volume dictionary based on historical principles and compiled in over 52 years. All entries (254165) in the online version were manually examined, and 334 Urdu COS predicates were found to fall in three broad categories: simple predicates, complex predicates and even predicates (see Table 3.2 below). A simple predicate is a single lexical item, e.g., *jəl* 'burn', *pɪg^{h}əl* 'melt', *gəl* 'decompose', but a complex predicate comprises at least two individual predicates with one clausal structure (Butt, 1995). The first predicate which carries the core meaning can be a verb, a noun or an adjective, and the second predicate usually called light verb inflects for tense, number and gender (Butt, King, Nino & Segond, 1999), e.g., *mər ja* (V-V,

'die-go'), *ʈʊkɽe ho/kər* (N-V, 'pieces-become/do'), *xʊʃk ho/kər* (Adj-V, 'dry-become/do'), etc. An even predicate comprises two semantically related verbs which are used together in a more abstract meaning that might not be exactly the same as encoded by individual verbs (Raza, 2011), e.g., *cir p^{h}aɽ* (V-V, 'cut-tear'), *gəl səɽ* (V-V, 'rot-burn'), etc. Unlike complex predicates, both verbs in even predicates are inflected similarly for tense, number and gender, and cannot be distinguished as main verb and light verb because the meanings of the even predicates are contributed by both verbs. For English de-adjectival verbs such as *harden, redden, weaken*, etc., the corresponding simple predicates are rarely available in Urdu. Few exceptions include *gərma* (*gərm → gərma*) 'make hot' and *nərma* (*nərm → nərma*) 'soften'. The corresponding Urdu COS counterparts are complex predicates usually of 'Adj-V' form (e.g., *sʊrx ho/kər* 'redden'). Since subcategorization frames of complex predicate types 'N-V' and 'Adj-V' are jointly determined by two component predicates, complex predicate formation is a valency changing operation in these cases, as pointed out by Butt and King (2006). However, this study observes that what Butt (1995) calls aspectual complex predicates, 'V-V' type, do not change the adicity of the main verb, as discussed below.

Table 3.2

The Urdu COS Predicates (n=334)

Simple Predicates 123				Complex Predicates 190			Even Predicates 21			
Non-alternating 32		Alternating 91		Alternating 190			Non-alternating 09		Alternating 12	
Intr-Only	Tr-Only	2-Var	3-Var	N-V	Adj-V	V-V	Intr-Only	Tr-Only	2-Var	3-Var
13	19	57	34	39	121	30	06	03	09	03

Complex predicates are all alternating in their behavior, but simple and even predicates further divide into three subcategories: anticausative-only, direct-causative-only and alternating. In view of this variability in the Urdu COS verbs' behavior, and the fact that transitivity is a stratifying

variable, any uniform sampling may lead to redundancies for a subclass and risk missing others. Therefore, stratified random sampling seems to be an optimal choice, for it samples each stratum proportionally to ensure its adequate representation (see Buchstaller & Khattab, 2013). However, in view of the scope of the present study, the empirical focus remains on simple predicates.

For a comprehensive selection of simple predicates, the following steps were taken: (a) a list of 142 COS simple predicates was prepared after consolidating the data from lexical translation list (105 verbs), Urdu WordNet (67 verbs) and Urdu Lughat (123 verbs), (b) the list was then presented to 10 Urdu consultants to sort out the common from the uncommon/obsolete verbs (this decision was made on the basis of observation that Urdu Lughat, being complied on historical principles, has lots of verbs which may be out of use in modern Urdu), and (c) figurative/literary examples were avoided. The final list, thus, amounted to 112 verbs (see Appendix A) and included those verbs which constituted common vocabulary confirmed by dialogical introspection. The distribution of 112 simple predicates is as in Table 3.3.

Table 3.3

The Urdu COS simple predicates (n=112)

Alternating 82 (73.21%)		Non-alternating 30 (26.79%)	
2-Variant	3-Variant	Direct-causative-only	Anticausative-only
43 (38.39%)	39 (34.82%)	15 (13.39%)	15 (13.39%)

According to the Urdu Lughat data, seven 2-variant verbs (*təl* 'fry',*dəl* 'crush', *dʰʊn* 'card cotton', *rə̃g* 'color', *kʊtər* 'snip', *gʰəṛ* 'chip, make', *məsəl* 'crush') don't have anticausative variants. While implementing the above measures, the online resources other than Urdu WordNet and Urdu Lughat were also consulted and cited where needed. If the literal usage of a COS verb or

any variant of it was not found in the above lexical resources, researcher's and consultants' introspection was entertained as discussed in the next section 3.2.2.4.

A few remarks on the usage of complex predicates (V_1-V_2) as examples in the present work. As noted by Butt (1995), in present day Urdu, what she calls "Aspectual complex predicates" (i.e., 'V_1-V_2' type) are preferred to simple predicates (V_1). She observes that to native speakers, the action seems *incomplete* or *unsituated* when only a simple verb is used. It follows that the light verb (V_2) contributes aspectual information (a sense of completion to the action). To illustrate, consider the examples in (5):

(5) a. ali=ne xət **lɪkʰ-a** (Simple predicate)
ali=ERG letter write-PRF.M.3SG
'Ali wrote a letter.'
b. ali=ne xət **lɪkʰ li-ya**
ali=ERG letter write.NFN take-PRF.M.3SG (Complex predicate)
'Ali wrote a letter (completely).'

Butt's observation that "the action seems incomplete" may be valid for non-COS verbs but may not account for COS verbs' status as result verbs, which by definition, encode the final stage of the event they describe, that is, COS verbs are already specified for completeness, and the sense of completeness contributed by any matching light verb makes no significant difference, which is relevant to the present study (by the way, Butt (1995) hasn't illustrated the phenomenon of aspectual complex predicates with COS verbs). However, native speakers' intuitive feeling of 'unsituatedness' in the use of a simple predicate, as also confirmed by our informants, seems to be one of the main reasons for preferring complex predicates to simple predicates.

The Urdu aspectual complex predicates pattern like simple predicates with regard to verb agreement, anaphora and control. The modification, coordination and scrambling facts also show that the main verb and the light verbs in aspectual complex predicates could be analyzed as paralleling the structure of a simple predicate with auxiliaries (Butt, 1995; Butt & Ramchand,

2005; Ramchand, 2008). However, in contrast to Hook's (1991) position that the light verb has no bearing on issues like case marking and argument structure, Butt argues that the light verbs in aspectual complex predicates not only contribute aspectual information in terms of inception and completion, but also express whether or not a given action was performed volitionally. These semantic contributions are reflected in the syntax through case-marking on the subject.

Despite the observation that choice of simple predicate or complex predicate covers subtleties in usage, our choice of aspectual complex predicate[16] versions of simple predicates is based on the observation that both predicates display the same causative alternation behavior, that is, there is no difference between the variants with respect to adicity and semantic relation defining the causative alternation phenomenon. As to the aspectual contribution of light verbs (according to Masica (1976 as cited in Butt, 1995), a light verb is used to contribute "completion, suddenness, directionality, benefaction, intensity, violence, stubbornness, reluctance, regret, forethought, thoroughness, etc." (p.143)), it has no bearing on the Urdu COS verbs' causative alternation behavior, which can exhibit aspectual meanings without light verbs as a necessary condition. So in the examples given in this thesis, the primary focus has been on the lexical semantics of COS verbs (V_1 in complex predicate versions). Though the constituent verbs in an Urdu complex predicate form a tight syntactic unit, the light verb neither adds nor deletes any argument the main verb licenses, as illustrated in (8) above. Moreover, the semantic relation between the variants of the alternating verbs remains regular, that is, the transitive use of a verb *V* has roughly the meaning 'cause to *V*-intransitive'. And this aspect of the Urdu COS verbs is under focus in the present study.

[16] Please be reminded that the present discussion on (V1-V2) aspectual complex predicates is not applicable to (Adj-V) and (N-V) complex predicates. In the latter cases, the adicity typically results from the argument fusion of the two constituent predicates.

3.2.2.4 Introspection.

Linguistic introspection is "conscious attention directed by a language user to particular aspects of language as manifest in her cognition" (Talmy, 2007, p.xii). Introspective knowledge is readily available and enables the researcher (a native speaker) to invent examples instantly for analysis (Talmy, 2000). Appealing to introspection is also "a productive strategy in instances in which it is not possible to compile a truly comprehensive corpus of natural speech" (Himmelmann, 2012, p.203). However, overreliance on introspective intuitions as is the typical practice in generative tradition (see Newmeyer, 1998) can result in "the construction of elaborate theoretical edifices supported by disturbingly shaky empirical evidence" (Wasow & Arnold, 2005, p.1482) because "the desire to provide a neat analysis within the favored theory may cloud the linguist's native speaker intuitions" (Börjars, 2006, p.10). For instance, despite the ungrammaticality of verbs of manner of speaking with dative NP syntax (e.g., *Susan whispered /yelled/ mumbled /barked /muttered . . . the news to Rachel* / **Susan whispered / yelled /mumbled/barked/muttered . . . Rachel the news*.), as reported in Pinker (1989), Levin (1993) and Krifka (2001), Bresnan and Nikitina (2008) find the corpus evidence that people do generate dative NP syntax: *Shooting the Urasian a surprised look, she* ***muttered him a hurried apology*** *as well before skirting down the hall,* or *I still can't forget their mockery and laughter when they heard my question. Finally a kind few (three to be exact) came forward and* ***whispered me the answer.*** Such cases have led many researchers to argue that individual introspection alone may lead to incorrect theorizing mainly because of the small number of participants (typically one) and stimuli, and cognitive biases on the part of the researcher (Cowart, 1997; Featherston, 2007; Gibson & Fedorenko, 2010, 2013; Marantz, 2005; Myers, 2009a; Schütze, 1996; Wasow & Arnold, 2005, among others).

For avoiding any observer bias and obtaining stable measures of grammaticality (see Schutze, 1996), "it is necessary to average over responses provided by a number of informants" (Dabrowska, 2010, p.2). Therefore, as a methodological caution, the researcher's introspection was corroborated by dialogical introspection (Valsiner, 2017), that is, by the introspections of other Urdu speakers through experimentation, which helped to rule out the peculiarities of individual speakers and achieve a consensus view. For this purpose, the selection criteria for information-rich sample of consultants (see Perry Jr., 2005) included: (a) both male and female informants, considering that gender plays its role in the choice of expression (Abbi, 2001), (b) various age groups, considering that these age groups are able enough to do some linguistic reflection for subtle semantic differences, and that a language variation, if any, is easily detectable between the younger and the old generations (Abbi, 2001), and (c) mother tongue and Urdu experience, considering Pakistan's complex sociolinguistic profile where most people speak at least one language as a mother tongue (Punjabi (44.15%), Pushto (15.42%), Sindhi (14.10%), Balochi (3.57%.), and Urdu and other languages as mother tongue (26.33%)), and Urdu as a national language, a lingua franca (Mansoor, 2005). So in a multilingual society, linguistic background is likely to contribute to the variance found in the use of a lingua franca.

The previous works on lexical causatives in Urdu-Hindi (Bhatt & Embick, 2004; Butt, 1995; Hautli-Janisz, 2014; Ramchand, 2008, 2014; Raza, 2011; Richa, 2008; Saksena, 1980, 1982, among others) also received an in-depth review for understanding the types, coverage and sources of data used. The critical review of the data used in previous research uncovered gaps in data and thus helped define the depth and breadth for linguistic evidence required to address the present study's research problems (see the next section 3.2.2.5). The previous data was compared with that of the present study to build a good understanding of theoretical claims.

3.2.2.5 Acceptability judgment task.

As is evident from the sections 3.2.2.1–3.2.2.4 above, at the time of this study there was no Urdu lexical data resource rich enough to provide all the relevant im(possible) uses of COS verbs. While reviewing the data used in the previous studies, the present researcher also observed that some studies (e.g., Bhatt & Embick, 2004; Raza, 2011; Richa, 2008) supplied such variants of the Urdu COS verbs whose grammatical reality seemed to be questionable. To illustrate, the Urdu intransitive *suj* 'swell' has the transitive variant *suja*, but its indirect causative variant *sujva* is a doubtful case and is not listed even in Urdu Lughat, the largest available lexical resource. However, Raza (2011, p.25) applies the productive indirect suffix *-va* to this verb and presents *sujv*a as the third variant of the verb *suj*. Likewise, the *-va* indirect causative form *ʊbəlva* of *ʊbəl* 'boil', as given in Bhatt & Embick (2004, p.45), and the indirect causative form *cətəkva* of *cətək* 'crack', as given in Richa (2008, p.149), are not available in Urdu Lughat. Such cases might be taken as morphological creativity, but not productivity, like Wiktionary's category 'protologism': newly coined words and phrases defined in the hope that they will become accepted into the language, but which are not actually in wide use. No dictionary, due to its temporal nature, can be the ultimate arbiter for wordhood in any language (Lieber, 2009), and morphological productivity is a possibility (*-va* affixation in Urdu is a productive process for indirect causative, but not an all-and-nothing matter), yet measuring acceptability of the Urdu COS verbs' transitivity status that can hold up to the current use is important for establishing the objectivity of evidence that can be safely incorporated into the body of knowledge in the field without any data dispute. To this end, a Likert-type acceptability judgement task (see Appendix B) was designed for data elicitation from native Urdu speakers' mental lexicons, assuming that

the lexicon is part of the socially shared *langue*, to use Saussure's term (1916/2011), despite the fact that it exists in an individual speaker's mind (cf. Chomsky's 1980).

Acceptability judgments are a speaker's reported perceptions of the well-formedness, nativeness, or naturalness of linguistic forms, which, as behavioral responses, can be used as evidence for making inferences about the cognitive system that subserves them (Myers, 2009a & b; Shütze, 2013; Sprouse & Almeida, 2013). In this study, the formal judgment experiment was taken as an optimal choice for two main reasons: (a) it can help elicit responses to such sentence types that might occur very rarely in spontaneous speech and recorded corpus, and (b) it can help obtain negative evidence about the verbs' alternation variants that scarcely exist in normal language use. As to the choice of Likert-type scale, this numerical task, unlike the forced-choice task, provides information about where a given sentence stands on the acceptability scale (the size of difference between conditions) (see Myers, 2009a). As pointed out by Shütze (2013), this information is important because a difference between sentences in the middle of the spectrum may call for a different kind of explanation than a difference between sentences at the high or low end of the spectrum. The data distributed along a scale thus calls for a careful theorizing. As to the research participants, there exists a debate about who are the best subjects for judgment tasks (see Culbertson & Gross, 2009; Devitt, 2006). As observed by Johnson (2008), acculturation in the study of linguistics is likely to make a linguist's intuition more sophisticated than a nonlinguist's, and may infect the data with the linguist's theoretical commitments. Moreover, a linguist's judgments alone are less likely to be representative of the population as a whole (Dabrowska, 2010). A representative data set indeed requires data sampling from all relevant sources and segments of population, which is, however, beyond the scope of this qualitative case study. However, this study engaged subjects, linguists and non-linguists, using

purposive sampling. This type of nonprobability sampling does not guarantee that each element of the population is represented in the sample, yet it is deemed to be appropriate for the types of problems raised in this study. The distribution of the subjects by number, education, age, and gender is given below in Table 3.4.

Table 3.4

Distribution of subjects (n=40)

Subjects	Number	Education	Age	Gender
Linguist	13	Under-/postgraduate	21-60	M=8, F=5
Non-linguist	27	Under-/postgraduate	21-60	M=16, F=11

Following the underlying logic of formal acceptability judgment experiment (see Sprouse & Almeida, 2012, 2013), the researcher first carefully constructed a set of conditions to rule out known nuisance variables so as to minimally contrast the syntactic property of the Urdu COS verbs – (in)transitivity. In order to determine the transitivity status of COS verbs, the focus remained on the morphosyntactic aspects, rather than semantic and pragmatic ones (see Kittilä, 2002 for detail). That is, a COS verb requiring only one argument is intransitive (anticausative), two transitive (direct causative) and three indirect causative. The change in transitivity status is typically concomitant with that in a verb's morphology. Having defined conditions, three sentences for each Urdu COS verb were constructed by using productive morphemes *-a* and *-va*, which are typically used to produce direct causative and indirect causative forms of verbs respectively; this causativization process along with concomitant phonological changes was applied only to those cases that lacked 3-variant paradigm common to alternating verbs in Urdu. Special care was taken to rule out any lexically driven extraneous factors such as sentence plausibility or word frequency imbalances. The task included 112 Urdu COS verbs and the

stimuli, thus, consist of 336 (112×03) sentences. In case of intransitive-only and transitive-only verbs, the other two uses were distractors (direct causative and indirect causative in case of intransitive-only, as in *əpʰər* 'distend'→ **əpʰra* and **əpʰərva*, and anticausative and indirect causative in case of transitive-only verbs, as in **cə̃d* 'flatten'→ *cə̃d* and **cə̃dva*). The order of alternating and non-alternating verbs was also kept different so that the effect of speakers' prior judgments on the next ones may be minimized (see Johnson, 2008). The rating scale for stimuli was adopted from Culbertson and Gross (2009). Finally, to find out the effect of syntactic manipulation on the relative acceptability of the conditions, each subject was provided with a questionnaire including explicitly stated task instructions, and asked to rate three types of sentences for each COS verb on a scale of 1–4 (1= perfect, 2=okay, 3=awkward, 4=terrible).

To conclude section 3.2 as a whole, the data collection process was driven by the overall research purpose of the study. The relation of complementarity and validation between the corpus (lexical translation, Urdu WordNet and Urdu Lughat), introspection and experimentation for obtaining relevant data for these questions is evident in the fact that they consolidate one another. However, some limitations are as follows. As an empirical evaluation of certain theoretical claims, this study should have ideally used a sizable, representative and balanced corpus of naturally occurring expressions as a data source. However, in the absence of such a corpus, the study had to resort to multiple primary and secondary sources to meet data requirements. Secondly, due to the time and scope constraints of the study, it was limited to simple predicates and its findings might, thus, not be generalizable to complex and even predicates. Thirdly, the list of 112 Urdu COS verbs included the most commonly used verbs confirmed by dialogical introspection and excluded uncommon verbs whose linguistic behavior might not be predictable precisely on the basis of present findings. The data was also collected

through experimentation from 40 subjects for judgment task. The subjects from Pakistan were contacted either through WhatsApp or an email invitation extended by the researcher after identifying their potential for rich information. Also, the study was carried out in three logistically feasible research sites: Dunedin (New Zealand), Lahore and Narowal (Pakistan). No randomization can, therefore, be claimed.

3.3 Data Analysis Procedure

This study assumes that verb meaning is a factor in determining verb behavior. The semantically coherent verbs show more or less similar morphosyntactic behavior because certain facets of their lexical semantic representation are preserved in the syntactic realization of their arguments (Levin, 1993; Levin & Rappaport-Hovav, 1995, 2005). This basic assumption underlying event structure and the assumption that grammar consists of independent generative components as detailed in Chapter 2 guide the data analysis stage. The data analysis for themes and discrepancies is conducted as follows:

1. First, a comparison between the data from Urdu WordNet and that from Urdu Lughat was made, which confirmed our preliminary research that the Urdu COS simple predicates fall into two main categories: non-alternating and alternating. The non-alternating category subdivides into (a) those verbs which have only an anticausative form and (b) those which have only a direct causative form. The alternating category consists of those verbs which have both causative and anticausative forms; this category too subdivides into two further categories in terms of number of variants: two-variant and three-variant verbs. Now the distribution of COS verbs as per Urdu WordNet and Urdu Lughat (see Table 3.2) was compared with the distribution in participants' judgments to find discrepancies, if any, by subjecting the data to descriptive statistics. For the distribution

of COS verbs in participants' judgments, responses to transitivity judgment task (15390) were entered into SPSS 25 and validated. In this way, the synchronic transitivity status of the Urdu COS verbs was established for the next stage of analysis: causative derivation (see Chapter 4 for a detailed analysis).

2. The second step was to work out the alternating COS verbs' morphological derivation. To this end, first of all, 82 alternating Urdu COS verbs' morphological roots were extracted by removing the infinitive marker *-na* from their dictionary entries. Then every morphological root was syllabified to establish its syllable structure which serves as an input to morphological derivation. In this way, the nature of interaction between a morphological root's syllable structure and its derived causative variants becomes obvious with respect to morphological complexity and directionality patterns. The derivational directionality, then, helps explore the morphosemantics of the causative alternation variants. In this regard, the main question to be explored is whether a causative derivation from the morphological root is a semantically monotonic or nonmonotonic process: for instance, do the direct causativizer *-a* and indirect causativizer *-va* always add meaning to their input? To address this question, the lexical semantic representations of both morphological roots and causative affixes were explored in terms of the event structure account. The purpose was to find a pattern, if any, between the morphological and semantic derivations of the causative alternation variants.
3. The first two steps of analysis provide a solid foundation for addressing our third research question: How does a semantic root relate to an event schema in a verb's semantic representation? Based on the findings from steps one and two above, the next step was to determine the ontological categorization of the Urdu COS verbs' semantic roots by

applying various diagnostics. The question here is what lies in a COS verb's semantic root: manner, or result, or both. After that, the association of semantic root with primitive predicates, the components of the event schema, were analyzed, exploring if the root, which is assumed to be constant across all variants, always serves as an argument of BECOME predicate in COS verbs' event schema, as assumed in our theoretical framework. What is the status of a manner component in case some COS verbs are found to lexicalize manner + result? Also, does the addition of causativizers to the morphological root result in the event schema augmentation only, keeping the root semantics constant? These subquestions are addressed in Chapter 5.

4. The fourth step concerns our fourth research question: How does a root-event schema-based representation map onto a syntactic representation? Based on the findings from the previous stages of data analysis, this question explores how semantic root and event schema contribute to argument realization. The focus here is on how root participants and event schema participants of the Urdu COS verbs interact to allow multiple argument options. So this step articulates the mapping between verbs' lexical semantic representation and syntactic representation. For the syntactic representation of a basic clause, Culicover and Jackendoff's (2005) Simpler Syntax model is adopted, keeping into account the relatively free order of the grammatical system of Urdu. The prominence relations among arguments are defined in terms of event geometry, and the linking rules are formulated in terms of the interaction between arguments' event-based causal responsibility, and language-specific semantic case and aspectual systems.

3.4 Conclusion

The main purpose of this study is to examine licensing conditions for the causative alternation. For probing into the Urdu COS verbs' meaning and behavior relation as an overall purpose of this study, the implications of a verb's morphosyntactic behavior are examined for its semantic representation (event structure) and for the principles mapping from such a representation to the syntax. As pointed out by Levin (1993), this technique is important since introspection alone cannot pin down the meanings of words. Furthermore, for ensuring validity and reliability in data collection and analysis at all levels, data was triangulated, and analysis was made as explicit as possible for the empirical evaluation of the theoretical assumptions taken as a starting point for this study. The overall design and execution of this study was dictated by several research-based and practical considerations. The next Chapter 4 concerns the interaction between the Urdu COS verbs' morphological derivation and lexical semantic derivation, the relation that addresses the first two research questions stated above.

Chapter 4

Causative Derivation

While languages share the semantics of the causative alternation (the transitive use of a verb V means roughly 'cause to V-intransitive' (Levin, 1993)), they show variation in its formal realization (Comrie, 1985; Haspelmath, 1993; Song, 1996). Since the causative alternation is commonly assumed to demonstrate the morphological relations between the alternates in most verbal systems (Laks, 2014), the question arises about the semantic and syntactic effects of these morphological relations between the variants. Given that Urdu involves a morphologically-mediated directed alternation (see Saksena, 1982c), this chapter uses morphological evidence to characterize the basic/derived distinction between the variants of COS verbs, that is, which variant is basic and how it relates to other morphological variants. The chapter is organized as follows. Section 4.1 explores the derivational operations involved in the Urdu COS verbs' causative alternation variants and shows gradient productivity in these operations. Section 4.2 compares primary and secondary data and discovers the dynamic nature of the causative derivation, showing the gap between what dictionaries register and what is non-actualized potential. Section 4.3 is about the semantic and syntactic effects of the dynamic and productive causative derivational operations, providing evidence for lexical *semantic* representation and lexical *syntactic* representation as two distinct but related levels of lexical representation. Section 4.4 deals with the lexical distinctions among the Urdu COS verbs. Section 4.5 shows how the causative derivational operations reveal the interface nature of the lexicon. That is, rather than being an unordered list of lexical formatives, the lexicon licenses interfaces between phonological, syntactic and semantic features, and the contextual features of lexical items constrain the formation of larger syntactic units. Section 4.6 concludes the chapter.

4.1 Gradient Productivity[17]

Urdu is among those languages that mark a particular direction of causative derivation. The Urdu COS verbs' causative alternation is typically morphologically marked, and maximally involves three variants – anticausative, direct causative and indirect causative:

(1)	a. Anticausative (C^{anti})	*pək*	'Y become cooked'
	b. Direct causative (C^{d})	*pə.k-a*	'X cause Y to become cooked'
	c. Indirect causative (C^{ind})	*pək.-va*	'Z cause X to cause Y to become cooked'

As mentioned in Chapter 1, the term 'anticausative' means that the 'cause' element is eliminated from the linguistic coding, but not necessarily from the conceptual event structure; it is not taken to mean an inchoative verb derived from its causative counterpart. The terms 'direct' and 'indirect' refer to whether the 'cause' argument is directly (without an intermediary agency) or indirectly (with an intermediary agency) involved in the event. As to the state predicates associated with COS predicates in our 112-COS-verb sample, all except one (*nərma* 'soften') are deverbal, that is, adjectives predicating state are derived from COS verbs; the form 'base *verb-A huA*' (i.e., the perfect form of the basic verb is followed by the perfect form of the verb *huna* 'to be') "signals a state resulting from the action of the verb" (Kachru, 2006, p.229). However, the Urdu COS complex predicates are derived from state predicates (e.g., adjective *-ho*/*kər* as in *saf ho/kər*: *saf* 'clean', *saf ho* 'be/become clean', and *saf kər* 'cause to become clean'. So, in Dixon's (1982) terminology, the states associated with the Urdu COS verbs are result states that presuppose some prior action, and the states associated with adjectives without *ho*/*kər* light verbs are property concept states that presuppose no prior action (states naturally denoted by adjectives related to age, color, speed, etc.). Thus, the result states are conceptually and morphologically

[17] Productivity here refers to the degree to which a morphological operation can be used to create new words. The assumption is that morphological processes/rules/affixes display different degrees of productivity (Bauer, 2001, 2019), e.g., the suffix *-ness* as in *sadness* is more likely to be used to create new words than *-th* as in *warmth*. This study uses frequency criterion to establish the degree of productivity of a morphological operation; productivity is defined in terms of the number of available bases (Lieber, 1981).

complex, but the property concept states are basic. This also illustrates Dixon's observation that the morphological complexity of a state predicate depends on the nature of the state: words denoting property concepts are morphologically simple, while words denoting result states are often morphologically complex. See Koontz-Garboden (2007) for morphological encoding of state and its associated changes of state.

Given the three variants of an alternating verb, assuming each to be an independent lexical entry would be conceptually unsatisfactory in that it disallows any generalizations about alternating verbs. Since the three variants seem to be derivationally related, the question is which of the three variants is basic and how this derivation takes place. The data analysis reveals that the derivational operations involved in the Urdu COS verbs' causative alternation come in three types: concatenative (*-a* and *-va* suffixation), non-concatenative (base modification, subtraction, conversion) and what might be termed trans-concatenative (a mix of the both concatenative and non-concatenative operations). Table 4.1 below shows the distribution of types and directionality of 121 formal operations found in 82 alternating COS verbs'derivation.

Table 4.1

Derivational operations in the Urdu COS verbs (n=121)

Concatenative	Non-concatenative	Trans-concatenative
60 (49.59%)	36 (29.75%)	25 (20.66%)
1. C^{anti} + *-a* → C^{d} (20=16.53%) 2. C^{anti} + *-va* → C^{ind} (33=27.27%) 3. C^{d} + *-va* → C^{ind} (7=5.79%)	Mod of C^{anti} → C^{d} (36=29.75%)	1. Mod of C^{anti} + *-a* → C^{d} (20=16.53%) 2. Mod of C^{anti} + *-va* → C^{ind} (5=4.13%)

Note. C^{anti} = anticausative, C^{d} = direct causative, C^{ind} = indirect causative, Mod = modification

As is evident in Tables 4.2 and 4.3 below, besides concatenative suffixation (e.g., *jəl* 'Y become burnt'→ *jə.la* 'X cause Y to become burnt', and *jəl* 'Y become burnt' → *jəl.-va* 'Z cause X to cause Y to become burnt'), the non-concatenative operations attested in the data include base

Table 4.2

Types of direct causativization (n=75)

-a suffixing	base mod+*-a*	base mod		conversion	suppletion	*-va* suffixing
1. ʊg → ʊ.g-a	1. jag → jə.g-a	1. c^hən → c^han	17. rõd→ rɔ̃d	1. nər.ma → nər.ma	ʈuʈ → toɾ	p^hʊl → p^hʊl.-va
2. bʊj^h → bʊ.j^h-a	2. p^hul → p^hʊ.l-a	2. kəɾ^h → kaɾ^h	18. sĩk → sĩk	2. tən → tən		
3. bəɾ^h → bə.ɾ^h-a	3. suj → sʊ.j-a	3. mʊɾ → moɾ	19. kət → kaʈ			
4. p^huʈ → p^hu.ʈ-a	4. suk^h → sʊ.k^h-a	4. bəʈ → baʈ̃	20. kʊʈ → kuʈ			
5. p^həl → p^hə.l-a	5. ə.kəɾ → ək.ɾ-a	5. b^{h}ʊn → b^{h}un	21. k^{h}ɪc → k^{h}eč			
6. jəm → jə.m-a	6. bə.dəl → bəd.l-a	6. b^{h}ig → b^{h}ə.go	22. g^{h}ʊʈ → g^{h}oʈ			
7. xəm → xə.m-a	7. b^{h}ə.ɾək → b^{h}əɾ.k-a	7. pɪs → pis	23. məɾ → maɾ			
8. k^{h}ɪl → k^{h}ɪ.l-a	8. pɪ.cək → pɪc.k-a	8. pɪl → pil	24. ʊ.bəl→ ʊ.bal			
9. k^{h}əl → k^{h}ə.l-a	9. pɪ.g^{h}əl → pɪg^h.l-a	9. p^həʈ → p^haɾ	25. ʊ.jəɾ→ ʊ.jaɾ			
10. gəl → gə.l-a	10. pə.nəp → pən.p.-a	10. təp → tap	26. ʊ.jəl → ʊ.jal			
11. pək → pə.k-a	11. tə.ɾək → təɾ.k-a	11. cɪr → cir	27. ʊ.d^{h}əɾ→ ʊ.d^{h}eɾ			
12. p^hel → p^he.l-a	12. ʈ^{h}ɪ.ʈ^{h}ər → ʈ^{h}ɪʈ^h.r-a	12. c^{h}ɪd → c^{h}id	28. bɪ.gəɾ → bɪ.gaɾ			
13. jəl → jə.l-a	13. j^{h}ʊ.ləs → j^{h}ʊl.s-a	13. c^{h}ɪl → c^{h}il	29. tə.rəʃ → tə.raʃ			
14. səɾ → sə.ɾ-a	14. cə.ʈəx → cəʈ.x-a	14. dəɣ → daɣ	30. sʊ.d^{h}ər → sʊ.d^{h}ar			
15. kəs → kə.s-a	15. cə.ʈək → cəʈ.k-a	15. ɖ^{h}e → ɖ^{h}a	31. sʊ.kəɾ → sʊ.keɾ			
16. gɪr → gɪ.r-a	16. cə.mək → cəm.k-a	16. ɖub → ɖə.bo	32. nɪ.t^{h}ər → nɪ.t^{h}ar			
17. g^{h}əʈ → g^{h}ə.ʈ-a	17. də.hək → dəh.k-a					
18. g^{h}ɪs → g^{h}ɪ.s-a	18. sʊ.ləg → sʊl.g-a					
19. g^{h}ʊl → g^{h}ʊ.l-a	19. kʊ.cəl → kʊc.l-a					
20. cʊr.mʊr → cʊr.mʊ.r-a						

Based on type frequency in Table 4.2 above, the direct causative operations can be arranged on a scale ranging from the most productive to the least productive:

base modification **-*a* suffixing** **base modification+-*a*** **conversion** **suppletion** **-*va* suffixing**

← most productive **……**least productive →

Figure 4.1 A scale of productivity in the Urdu COS verbs' direct causativization

Table 4.3

Types of indirect causativization (n=46)

-*va* suffixing		base mod+-*va*	base mod+-*a*	-*a* suffixing
1. bʰʊn → bʰʊn.-va	20. gʰət → gʰəṭ.-va	1. bʰig → bʰɪg.-va	ʊ.bəl→ ʊb.l-a	bəṭ → bə.ṭ-a
2. pɪs → pɪs.-va	21. gʰʊṭ → gʰʊṭ.-va	2. pʰət → pʰəṛ.-va		
3. pək → pək.-va	22. gʰɪs → gʰɪs.-va	3. ṭuṭ → tʊṛ.-va		
4. pɪl → pɪl.-va	23. mər → mər.-va	4. ḍʰe → ḍʰə.-va		
5. pʰel → pʰel.-va	24. ʊ.jəṛ→ ʊ.jəṛ.-va	5. ḍub → ḍʊb.-va		
6. təp → təp.-va	25. ʊ.jəl → ʊ.jəl.-va	6. jag → jəg.-va		
7. jəl → jəl.-va	26. ʊ.dʰəṛ→ ʊ.dʰəṛ.-va			
8. cɪr → cɪr.-va	27. bə.dəl → bə.dəl.-va			
9. cʰɪd → cʰɪd.-va	28. tə.rəʃ → tə.rəʃ.-va			
10. cʰɪl → cʰɪl.-va	29. cə.mək → cə.mək.-va			
11. dəɣ → dəɣ.-va	30. sʊ.dʰər → sʊ.dʰər.-va			
12. rõd → rõd.-va	31. kʊ.cəl → kʊ.cəl.-va			
13. səṛ → səṛ.-va	32. təl → təl.-va			
14. sĩk →sĩk.-va	33. dəl → dəl.-va			
15. kəṭ → kəṭ.-va	34. dʰʊn → dʰʊn.-va			
16. kʊṭ → kʊṭ.-va	35. rə̃g →rə̃g.-va			
17. kəs → kəs.-va	36. gʰəṛ → gʰəṛ.-va			
18. kʰɪc → kʰɪc.-va	37. kʊ.tər → kʊ.tər.-va			
19. gɪr → gɪr.-va	38. mə.səl → mə.səl.-va			

In the light of Table 4.3 above, the indirect causative operations found in alternating COS verbs in Urdu can be arranged on a scale ranging from the most productive to the least productive:

-*va* suffixing **base modification+-*va*** **base modification+-*a*** **-*a* suffixing**

← most productive ……least productive →

Figure 4.2 A scale of productivity in the Urdu COS verbs' indirect causativization

modification[18] (vowel shortening and vowel lengthening) in which a part of the base[19] is phonologically changed, as in *mʊ̀ɾ* 'Y become bent' → *moɾ* 'X cause Y to become bent', subtraction where a segment from the base is deleted, as in *kʊ́.cəl* 'Y become crushed'→ *kʊ́c.l-a* 'X cause Y to become crushed', and conversion in which the form of the base remains unaltered. In conversion, unlike other operations, the sound-meaning resemblance among the base and the derivatives is total, not partial, as in *nər.ma* 'Y become soft'→ *nər.ma* 'X cause Y to become soft'. This process in Urdu appears to be a zero-affixation in that, with respect to argument structure realization, the causatives derived by conversion behave like those derived by overt affixation. In the above example, *nər.ma* behaves like any 2-variant alternating COS verb marked by *-a* suffixing (anticausative + *-a* → direct causative). In the whole data set, only one COS verb (*ʈuʈ* 'Y become broken'→ *toɾ* 'X cause Y to become broken') was found to exhibit the suppletive allomorphy which affects both base and affix, reflecting phonological, morphological or lexical conditioning. In several cases, both base modification and suffixation are involved together, which in this work is termed trans-concatenation, as in *cə.ʈəx* 'Y become cracked'→ *cəʈ.x-a* 'X cause Y to become cracked'.

The prominent patterns in direct causative derivation are *-a* suffixing, base modification (vowel shortening/subtraction) + *-a* suffixing, and base modification (vowel lengthening or vowel addition) (see Table 4.2 above). In most one-syllable bases, *-a* suffixing occurs without any base modification (except four cases – *pʰul* 'Y become inflated'→ *pʰʊ́.l-a* 'X cause Y to become inflated', *jag* 'Y become awake'→ *jə.g-a* 'X cause Y to become

[18] Due to the variability of base modification, this study makes no claim about any general phonological rule involved in the phenomenon. What exactly is the phonological process is unclear and is beyond the scope of this study. The variability might be due to morphophonology or diachronic phonology.
[19] The term 'base' in this work is not confined to the part of morphologically complex word that an affix is attached to; rather, it refers to the element of a morphologically complex word to which a morphological operation applies. This definition subsumes non- and trans-concatenative operations (see Haspelmath, 2002).

awake', *suj* 'Y become swelled' → *sʊ.j-a* 'X cause Y to become swelled', and *suk*^{h} 'Y become dry'→ *sʊ.k*^{h}*-a* 'X cause Y to become dry'). However, in two-syllable bases, the vowel in the second syllable is either lengthened without any *-a* suffixing, as in sʊ.kəṛ 'Y become shrunk'→ sʊ.keṛ 'X cause Y to become shrunk', or the vowel is subtracted before *-a* suffixing, as in *pɪ.g*^{h}*əl* 'Y become melted' → *pɪg*^{h}*.l-a* 'X cause Y to become melted'. In indirect causative derivation, the dominant pattern is *-va* suffixing of anticausative root without any modification in one-syllable or in two-syllable bases (see Table 4.3 above); only in four cases (*p*^{h}*əṭ* 'Y become burst'→ *p*^{h}*əṛ.-va* 'Z cause X to cause Y to become burst', *ṭuṭ* 'Y become broken'→ *tʊṛ.-va* 'Z cause X to cause Y to become broken', *ɖ*^{h}*e* 'Y become demolished' → *ɖ*^{h}*ə.-va* 'Z cause X to cause Y to become demolished', *ɖub* 'Y become drowned' → *ɖʊb.-va* 'Z cause X to cause Y to become drowned'), vowel/consonant modification occurs.

As evident in Tables 4.2 and 4.3 above, the causative alternation in the Urdu COS verbs is predominantly morphologically marked, and multiple morphological operations are involved. The literature shows consensus on additive morphology in canonical cases in Urdu/Hindi where *-a* and *-va* suffixing is involved with or without phonological effects (see Bhatt & Embic, 2004; Butt, 2003; Ramchand, 2011; Saksena, 1982). In non-canonical cases where the affixation is not available, and due to phonological variability, it is not possible to find some reliable criterion to decide on the matter, the present study assumes that morphosyntax and morphosemantics are more likely to constitute the relevant diagnostics. Based on this line of argumentation, the study aligns with the observation that in those cases where the affixation pattern is involved, anticausative form is basic and causatives derived. However, it differs on what Bhatt and Embic term 'basic transitives' on phonological grounds: vowel simplification (e.g., *mar/mər* 'kill/die'). As observed by Ramachand, the vowel simplification alone does not seem to be a reliable

criterion because it is also involved in some canonical cases where suffixation applies (e.g., *jag* 'wake'→ *jə.g-a*). Also, this pattern is also not synchronically productive (Ramchand, 2008, 2011).

Both *-a* and *-va* causative suffixes attach to the same morphological root, the anticausative form in our terminology, and add to its adicity. This observation aligns with Ramchand's that variants are based on the same root. If *-a* attaches to anticasuative form to derive direct causative, *-va* attaches, not to direct causative, but to the anticausative form to derive indirect causative, and if both *-a* and *-va* cannot attach simultaneously to anticausative form, this indicates that both suffixes are sensitive to the internal structure of their host. Bauer, Lieber, and Plag (2013) also point out that there are affixes in English (*-ancy/-ency, -ine, -en*$_V$*, -let, -ster*) that never attach to complex bases, and that therefore must have some way of 'seeing' whether a word is simple or complex. Also, as pointed out by Ramchand (2011), if it is assumed that the *-va* suffix attaches to an already transitivized form, one has to argue for a rule of allomorphy that spells out single causativization as *-a* and double causativization as *-va*. Masica (1991 as cited in Ramchand, 2011) observes that there are some Indo-Aryan languages where a single causative morpheme is found, which can be 'doubled' to get the effects of 'indirect' causation (e.g., Marathi). He further asserts that the languages in which there are two distinct morphemes which do not stack, as in Hindi/Urdu, the indirect causative is historically derived from a doubled direct causative. However, Butt (2003) finds no evidence for such a derivation.

The morphosemantic criterion adopted here is a methodological assumption "Taking Morphology Seriously" proposed by Koontz-Garboden (2007):

> For a morphologically marked/unmarked pair of lexemes sharing a common root and where at least one of the variants seems to be generated by a productive derivational process, in the absence of evidence to the contrary, assume the marked is derived from the unmarked, the latter taken to be lexically listed (pp.35–36).

The idea is that there is a non-trivial relationship between overt morphological derivation and lexical semantic derivation. However, in cases of zero or subtractive morphological operations, the presence/absence of lexical semantic primitives/operators (ACT, CAUSE, BECOME) in the lexical semantic decomposition of a morphological variant is taken as a criterion for determining the basic/derived status of that variant in a given context of use.

See section 4.4 for detail on how two of the main motivations for positing a dyadic base for alternating verbs – the ability to characterize the class of alternating verbs on the dyadic base and a purported asymmetry in the availability of variants – do not hold up under further scrutiny.

The observation that anticausative is basic is contrary to Haspelmath's (2002) observation: "In Hindi/Urdu, intransitive verbs are formed from transitive verbs by **shortening** the stem vowel (e.g. maar- 'kill'→ mar- 'die', khool- 'open (tr.)'→ khul- 'open (intr.)', pheer- 'turn (tr.)'→ phir ' turn (intr.)" (p.22). The observation that indirect causatives are typically derived by *-va* suffixation of anticausatives in Urdu is unlike those in other languages where the direction of derivation is: State → Anticausative Change of Sate → Causative Change of State. To illustrate, in Quechua (Van Valin, 2005, p.41; see Koontz-Garboden, 2009 for other such cases), a derivation operation marked by *-ya:* derives an inchoative, say, *hatun-ya:* 'become big' from a base *hatun* 'big', and then another operation marked by *-chi* derives from inchoative *hatun-ya:*, a causative form *hatun-ya:-chi* 'cause to become big'. In contrast, the Urdu *-va* invariantly operates on the base form, not on a derived form, and the direction for indirect causativization is Anticausative Change of Sate → Indirect Causative Change of State, not Direct Causative Change of Sate → Indirect Causative Change of State. Thus, we find no evidence in Urdu COS verbal domain that the *-va* causative embeds the *-a* causative (see Ramchand, 2014).

Out of total 121 operations, 94.21% are applied to anticausative bases[20]. From this, it follows that in terms of derivational directionality, the anticausative is basic, and both causative variants are derived. In Urdu Lughat data, as mentioned in Chapter 3, only seven cases (*təl* 'fry', *dəl* 'crush', *d^{h}ʊn* 'card cotton', *rə̃g* 'color', *kʊ.tər* 'snip', *g^{h}əṛ* 'chip, make', *mə.səl* 'crush') lack anticausative bases, and their direct causative bases are

-va suffixed for deriving indirect causatives. Such morphological facts of the Urdu verbs even in one semantic field (the COS domain) do not support Saksena's (1982a) four-term "strictly morphologically based" paradigm in Hindi-Urdu (e.g *kəṭ* 'cut'(Int), *kaṭ* (Tr), *kəṭa* (DC), *kəṭva* (IC))[21] and the hypothesis that transitives are basic and intransitives are derived because intransitives would be numerically limited. Saksena further argues that Intr → Tr is not a productive rule, but Tr → Intr is because where there are gaps in the data, given a Tr verb, a speaker can usually form a corresponding Intr verb. However, given an Intr with a short stem vowel, one can never freely form a corresponding Tr by vowel lengthening. Though Saksena's data on which she based her statement is not confined to any one semantic domain, her observation is challenged by the data from the domain of COS verbs, as given in Tables 4.2 and 4.3 below. Concerning her source of data, Saksena (1882c) observes: "The dialect reported here is mine [Lakhimpur-Kheri and Kanpur in the province of Uttar Pradesh, India], and no claims are made concerning either the normative value, or the prevalence of the reported forms" (p.7).

[20] The Urdu COS verbs have a few cases where one finds COS-denoting words that are derivationally related to words denoting states. Two such rare cases are *gərm* (adjective) 'hot' → *gərma* (COS verb) 'become/make hot', and *nərm* (adjective) 'soft' → *nərm*a (COS verb)'become/make soft'.

[21] Very few Urdu COS verbs might have two morphological options either for direct or indirect causative variant (e.g., bəṭ 'divide', bãt/bəta, *ḍub* 'drown', *ḍəbo/ḍuba* and *kəṭ* 'cut', *kaṭ*, *kəṭa*/*kəṭva*). Saksena (1982a) treats the morphological variants such as *kaṭ* (Tr= Transitive) and *kəṭa* (DC= Direct causative) as two separate categories despite the fact that the majority of verbs even in the COS domain alone do not have such morphological options, and the fact that they share the same event structure. As shown in Tables 4.2 and 4.3 above, cases such as *b^{h}ig* 'wet' → *b^{h}ə-go* questions the morphophonological contrast (long stem vs. short stem) which Saksena uses to define Tr. Also, if one cannot remove the semantic prime CAUSE from Saksena's Tr, Occam's Razor demands to dissolve this distinction, treating the Tr option as an alternative for DC, and delimiting the causative paradigm maximally to three terms that exhibit syntactically relevant semantics.

Saksena argues that the vowel alternation must go in the direction of 'transitive → intransitive' because there are cases of intransitives back-formed from transitives, which do not support a vowel-strengthening causativization as noted by Panini and the ancient grammarians (see Masica, 1991). However, as Ramchand (2008) points out, due to sound changes, particularly a collapsing of vowel distinctions in the 'short' versions found in intransitives, "the [vowel] alternation in the modern language does not appear to be particularly productive, and the pairs remain part of a closed class" (p.155).

The morphological facts about the Urdu COS verbs discussed here do not concur with Levin and Rapport-Hovav's (1995) original position, too, that a lexical semantic representation of an alternating COS verb is underlyingly transitive, and an unaccusative is derived from its corresponding causative. Their observation is based on the role of morphological marking in verb's transitivity status. The present study, however, demonstrates that Levin and Rapport-Hovav's position that, "alternating verbs are inherently dyadic causative predicates" (p.83), does not match the morphology of Urdu. The morphology of the Urdu COS verbs allows underlyingly intransitive verbs to participate in the causative alternation, contrary to Levin and Rapport-Hovav's position that only underlying transitive verbs participate in causative alternation (also see Volpe, 2008 for Turkish, Korean, Japanese and Chinese data for intransitive base).

In most cases of the Urdu COS causative derivation, anticausative maps onto direct and indirect causatives, as in Figure 4.1 below:

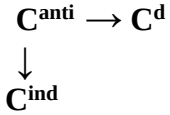


Figure 4.3 Mapping between the Urdu COS causative variants

But this mapping does not always result in a three-term derivational paradigm. The reason is that the derivational rules are not fully and equally productive; some may even be unproductive in

that they cannot be extended to new words except those to which they are currently applicable (see Bauer, 2001). The Urdu COS causative derivation reveals that morphological productivity is not a matter of either/or, but is a gradient phenomenon. That is, the causative productivity is scalar rather than categorical: apart from productive and unproductive rules, there are also rules of semi-/intermediate productivity (see Aarts, 2007 for gradience in grammar). For instance, in direct causative derivation, base modification is more productive than *-a* suffixing alone in that the former creates larger number of direct causative forms. On the other hand, conversion, suppletion and *-va* suffixing in the direct causative derivation appear to be unproductive in the Urdu COS verbal system since the application domain of these operations is very limited, and may not be extendable to new bases. See Tables 4.2 and 4.3 as well as Figures 4.1 and 4.2 above for the cases which support morphological productivity as a matter of degree.

The variable productivity of the morphological processes involved in the Urdu COS verbs' causative derivation indicates constraints on morphological processes. As pointed out by Bauer (2001), the phonological structure – segmental, suprasegmental or syllabic make-up – of the base may constrain a morphological process. For instance, in most disyllabic COS bases, the vowel in the second syllable is subtracted before *-a* suffixing as in *ə.kəṛ* 'Y become stiff'→ *ək.ṛ-a* 'X cause Y to become stiff' (see Table 4.2). The morphology of the base is relevant where it appears that an affix can be added only to a derived or to an underived base. For instance, the indirect causativizer *-va* prototypically suffixes to an anticausative base, not to a derived direct causative base, as in *p^{h}el* 'Y become expanded'→ *p^{h}e.l-a* 'X cause Y to become expanded', and *p^{h}el* 'Y become expanded'→ *p^{h}e.l-va* 'Z cause X to cause Y to become expanded ', but not **p^{h}e.l-a* 'X cause Y to become expanded'→ *p^{h}e.l-a-va* 'Z cause X to cause Y to become expanded'. The syntactic constraint becomes relevant when the word class of the base (e.g.,

noun, verb, adjective) is important in morphology. The direct causativizer *-a* is found with noun base as in *bərəf* 'ice' → *bərfa* 'X cause Y to become ice' and with adjective base, as in *nərəm* 'soft'→ *nərma* 'X cause Y to become soft', but the indirect causativizer *-va* rarely collocates with nominal or adjectival bases (e.g.,**bərəf* 'ice' → *bərəfva* 'Z cause X to cause Y to become ice'). This seems to be the reason that most of the nominal and adjectival bases which have direct causative variants lack indirect causative variants. In our COS data, there is only one exception where *-va* suffixes to a nominal base: rə̃g 'color' → *rə̃gva* 'Z cause X to cause Y to become colored'. The unproductive cases like conversion and suppletion seem to be lexically constrained in that these processes are found with a very small number of bases. In such cases, different etymological sources might be a possible account. As to the semantic constraints on the base, both *-a* and *-va* are not restricted to the COS verbs, but are also used in other semantic domains such as motion, emission, psych, etc. However, semantic compatibility between the lexical base and the causative suffixes is always a prerequisite. The morphological operations involved in the Urdu COS verbs' causative derivation thus show that morphology serves as an interface below the level of word and has implications for phonology, syntax and semantics, and that the interface between morphology and other linguistic components is constraint-based.

4.2 Dynamic Productivity

The above observation that morphological productivity in the Urdu COS verbs is gradable is based on data from Urdu WordNet and Urdu Lughat, the data sources detailed in Chapter 3. Since such lexical resources register morphology statically and often underrepresent the most productive morphological processes (see Bauer, Lieber & Plag, 2013), they can capture the gradeability of productive rules but not the dynamicity of their domains. It is, therefore, not useful to limit a productivity measure only to actual words as recorded in dictionaries.

Morphological rules are a part of speakers' linguistic competence and they can extend their existing domain of application, by producing new formations. So without the constraints of speakers' acceptability judgments, it is difficult to say what is possible and what is not possible. This difference between actual and possible words implies that morphological competence (the system of synchronic possibilities) and morphological performance (the actual use of the system) are not conceptually distinct, and should, therefore, not be studied separately (see Haspelmath, 2002). As pointed out by Bauer, Lieber and Plag "there are items which are not known to individuals, are not in the largest dictionaries, but have the potential to be words" (p.569). Potential words are of interest in morphology. "The speaker always has the capacity to make up new words which he can then add to his repertoire. It thus remains the task of a morphology to tell us what sort of new words a speaker can form" (Aronoff, 1976, p. 19). And this is confirmed by the judgment data of the present study. With respect to 112 COS verbs' causative alternation status, consensus between Urdu WordNet plus Urdu Lughat and speakers' judgments is found in 73 cases and difference in 39 cases, despite the high standard value of 66.7%: below 66.7% responses against the given verb's status in Urdu Lughat were not considered. The differential cases are given in Table 4.4 below:

Table 4.4

The Urdu COS verbs' causative alternation status

#	COS Verb	Urdu WordNet & Urdu Lughat	Judgment Task			Synchronic Status
			Anticausative	Direct Causative	Indirect Causative	
1.	ʊ.bəl 'boil'	3-v Caus	Y:100 %	Y:100 %	Y:22.5%, N:77.5%	2-v Caus
2.	ʊ.jəl 'brighten'	3-v Caus	Y:95%, N:5%	Y:87.5%, N:2.5%	Y:37.5%, N:62.5%	2-v Caus
3.	bʊj^{h} 'extinguish'	2-v Caus	Y:100%	Y:100%	Y:77.5%, N:22.5%	3-v Caus
4.	bə.g^{h}ar 'fry'	1-v Caus	Y:67.5%, N:32.5%	Y:85%, N:15%	Y:15%, N:85%	2-v Caus
5.	pɪ.cək 'flatten'	2-v Caus	Y:100%	Y:92.5%, N:7.5%	Y:92.5%, N:7.5%	3-v Caus
6.	pɪ.g^{h}əl 'melt'	2-v Caus	Y:100%	Y:97.5%, N:2.5%	Y:87.5%, N:12.5%	3-v Caus
7.	pɪl.pɪ.la 'pulp'	1-v Caus	Y:97.5%, N:7.5%	Y:85%, N:15%	Y:45%, N:55%	2-v Caus
8.	pɪl 'cush for oil/juice'	3-v Caus	Y:82.5%, N:17.5%	Y:97.5%, N:2.5%	Y:65%, N:35%	2-v Caus
9.	p^{h}uṭ 'bloom'	2-v Caus	Y:97.5%, N:2.5%	Y:10%, N:90%	Y:5%, N:95%	Anticaus
10.	p^{h}el 'expand'	3-v Caus	Y:100%	Y:97.5%, N:2.5%	Y:22.5%, N:77.5%	2-v Caus
11.	ta 'heat'	1-v Caus	Y:80%, N:20%	Y:87.5%, N:12.5%	Y:12.5%, N:87.5%	2-v Caus
12.	təp 'heat up'	3-v Caus	Y:100%	Y:95%, N:5%	Y:15%, N:85%	2-v Caus
13.	tə.rəʃ 'chip'	3-v Caus	Y:55%, N:45%	Y:100%	Y:87.5%, N:12.5%	2-v Caus
14.	tə.ṛəx 'crack'	Anticaus	Y:100%	Y:97.5%, N:2.5%	Y:40%, N:60%	2-v Caus
15.	təl 'fry'	2-v Caus	Y:92.5%, N:7.5%	Y:97.5%, N:2.5%	Y:85%, N:15%	3-v Caus
16.	jag 'wake'	3-v Caus	Y:100%	Y:97.5%, N:2.5%	Y:62.5%, N:37.5%	2-v Caus
17.	cãḍ 'flatten'	1-v Caus	Y:52.5%, N:47.5%	Y:97.5%, N:2.5%	Y:70%, N:30%	2-v Caus
18.	ʃən 'strain'	2-v Caus	Y:95%, N:5%	Y:100%	Y:82.5%, N:17.5%	3-v Caus
19.	cit^{h} 'crush with teeth'	1-v Caus	Y:57.5%, N:42.5%	Y:97.5%, N:2.5%	Y:67.5%, N:32.5%	2-v Caus
20.	dəɣ 'burn skin with iron	3-v Caus	Y:55.5%, N:45%	Y:97.5%, N:2.5%	Y:72.5%, N:27.5%	2-v Caus
21.	dʊb.la 'slim'	Anticaus	Y:80%, N:20%	Y:85%, N:15%	Y:22.5%, N:77.5%	2-v Caus
22.	dəl 'crush coarsely'	2-v Caus	Y:82.5%, N:17.5%	Y:97.5%, N:2.5%	Y:75%, N:25%	3-v Caus
23.	d^{h}õd.la 'blur'	Anticaus	Y:97.5%, N:2.5%	Y:97.5%, N:2.5%	Y:12.5%, N:87.5%	2-v Caus
24.	ḍ^{h}e 'collapse'	3-v Caus	Y:100%	Y:97.5%, N:2.5%	Y:62.5%, N:37.5%	2-v Caus
25.	rãg 'color, dye'	2-v Caus	Y:100%	Y:100%	Y:100%	3-v Caus
26.	sʊ.d^{h}ər 'improve'	3-v Caus	Y:100%	Y:100%	Y:30%, N:70%	2-v Caus
27.	sʊ.ləg 'kindle'	2-v Caus	Y:100%	Y:100%	Y:82.5%, N:17.5%	3-v Caus
28.	sən.sə.na 'simmer'	Anticaus	Y:95%, N:5%	Y:82.5%, N:17.5%	Y:20%, N:80%	2-v Caus
29.	sãv.la 'tan'	Anticaus	Y:100%	Y:80%, N:20%	Y:17.5%, N:82.5%	2-v Caus
30.	qəl.ma 'make crystal'	1-v Caus	Y:85%, N:15%	Y:95%, N:5%	Y:35%, N:65%	2-v Caus
31.	kəṛ.va 'become bitter'	Anticaus	Y:90%, N:10%	Y:67.5%, N:32.5%	Y:10%, N:90%	2-v Caus

32.	kʊm.la ‘wither’	Anticaus	Y:100%	Y:70%, N:30%	Y:10%, N:90%	2-v Caus
33.	k^{h}ɪl ‘bloom’	2-v Caus	Y:100%	Y:45%, N:55%	Y:10%, N:90%	Anticaus
34.	k^{h}ʊl ‘boil’	2-v Caus	Y:100%	Y:87.5%, N:12.5%	Y:70%, N:30%	3-v Caus
35.	gah ‘crush crop’	1-v Caus	Y:87.5%, N:12.5%	Y:95%, N: 5%	Y:30%, N:70%	2-v Caus
36.	g^{h}əṛ ‘chip, make’	2-v Caus	Y:92.5%, N:7.5%	Y:100%	Y:82.5%, N:17.5%	3-v Caus
37.	g^{h}ʊl ‘dissolve’	2-v Caus	Y:100%	Y:92.5%, N:7.5%	Y:77.5%, N:22.5%	3-v Caus
38.	g^{h}õg^{h}.ra ‘curl (hair)’	Anticaus	Y:90%, N: 10%	Y:85%, N: 15%	Y:50%, N: 50%	2-v Caus
39.	mʊṛ ‘bend’	2-v Caus	Y:100%	Y:100%	Y:67.5%, N:32.5%	3-v Caus

Note. Anticaus=Anticausative, 1-v Caus = one-variant causative, 2-v Caus = two-variant causative, 3-v Caus = three-variant causative, Y = yes, N = no

Though speakers may vary in their knowledge of words, what is of interest to a linguist is the gap between the actual words that dictionaries register and the non-actualized potential. Table 4.4 above and the comparison between Table 4.5 and Table 4.6 below confirm this gap. The causative alternation status of the Urdu COS verbs based on Urdu WordNet plus Urdu Lughat as given in Table 3.3 in Chapter 3, repeated here as Table 4.5 below, is as follows:

Table 4.5

The Urdu COS simple predicates (n=112)

Alternating 82 (73.21%)		Non-alternating 30 (26.79%)	
2-Variant	3-Variant	Direct-causative-only	Anticausative-only
43 (38.39%)	39 (34.82%)	15 (13.39%)	15 (13.39%)

Contrary to Table 4.5 above, the synchronic causative alternation status of the Urdu COS verbs, after consolidating date from WordNet, Urdu Lughat and the judgment task, is as follows:

Table 4.6

The Urdu COS verbs' synchronic status w.r.t. the causative alternation (n=112)

Alternating 96 (85.71%)		Non-alternating 16 (14.29%)	
2-Variant	3-Variant	Direct-causative-only	Anticausative-only
56 (58.33%)	40 (41.67%)	08 (50%)	08 (50%)

The comparison between Table 4.5 and Table 4.6 shows that at least 14 non-alternating verbs have assumed the status of alternating verbs and this confirms that speakers can extend the domains of morphological rules. Another observation worth noting is that some 2-variant verbs have become 3-variant verbs (e.g., *bʊjʰ* 'extinguish'), and vice versa (e.g. *pɪl* 'grind/crush to extract oil/juice'). This indicates the dynamic nature of morphological productivity.

Now the question arises why a productive rule does not produce variants it is expected to. Given the fact that COS verbs in Urdu canonically participate in the morphologically mediated causative alternation, why are some Urdu COS verbs only anticausative and some only causative, as shown in Tables 4.5 and 4.6 above? The domain of a productive rule less than the entire word-class implies some restrictions on the rule. The hypothetical formations presented to speakers in the acceptability judgment task reveal that the productivity of the Urdu causative rules depends on the phonological and semantic regularity of new formations. Some variants of the Urdu COS verbs are impossible because they disrupt phonetic processing (ease of articulation) (e.g., **bə.gʰar.-va* from *bə.gʰar* 'fry', **bɪ.lo.-va* from *bɪ.lo* 'churn', **pɪl.pɪ.la.-va* from *pɪl.pɪ.la* 'soften', etc.). In many cases, base-affix concatenation makes no sense. To illustrate, the indirect causativizer *-va* may not suffix to a base that denotes a natural process

where human agency is irrelevant (e.g., **pə.nəp.-va* from *pə.nəp* 'grow'). However, some semantic restrictions seem quite arbitrary (e.g., *cit*^{h} 'crush with/under teeth' lacks anticausative variant). The statistical tendencies among the Urdu COS verbs' causative derivation seem to be affected by a syntactic restriction that the base should be intransitive. A morphologically legitimate variant may be blocked by phonological or semantic similarity with other available words in the language (e.g., *pɪl* → *pil* 'crush to extract juice, etc.', but not regular *pɪla*, which may be taken as a direct causative form of *pi* 'drink'). Such morphological blocking indicates a meta-constraint which applies between two or more alternative possibilities. The observations made so far conclude that native speakers' morphological competence is dynamic and can extend the limits of a rule's domain, by categorizing the domain gradiently. The variation between participants is worth investigating itself, but is beyond the scope of the current thesis.

Such knowledge (more productive, less productive, various restrictions, gradability and domain extendibility) is more likely to be schema knowledge rather than rule knowledge which tends to be rigid: if A is true, then do B (Jackendoff & Audring, 2020; Sandra, 1995). Schemas represent the common features of morphologically related words[22], and have greater flexibility. To be more concrete, the following discussion draws on Jackendoff and Audring's (2020) formalization. In most one-syllable bases, *-a* suffixing occurs without any base modification and this regularity might be captured by a traditional derivational rule 'C^{anti} + *-a* → C^{d}'. However, four cases in our data (*p*^{h}*ul* 'Y become inflated'→ *p*^{h}*ʊ.l-a* 'X cause Y to become inflated', *jag* 'Y become awake'→ *jə.g-a* 'X cause Y to become awake', *suj* 'Y become swelled' → *sʊ.j-a* 'X cause Y to become swelled', and *suk*^{h} 'Y become dry'→ *sʊ.k*^{h}*-a* 'X cause Y to become dry'),

[22] A word here is defined in cognitive terms as "a symbolic label of mental categories referring to (in)animate objects, states, actions, conditions and qualities as they are perceived by and conventionally construed in the human mind in interaction with the social and natural environment" (Onysko & Michel, 2010, p.2). And word-formation processes are taken to indicate the creative capability of the human mind to construct and label new concepts out of existing mental categories.

despite their being one-syllable, undergo vowel modification when *-a* suffixed. Moreover, the verb *bɔs* 'Y become stale' satisfies the requirement of the rule, but fails to form direct causative. The simplest way to distinguish the forms that exist from those that do not is to list the forms that actually exist. But in that case the regularity of the pattern cannot be captured by a rule along the lines of "Add an *-a* to a one-syllable anticausative base that means 'Y become a state' to create a direct causative variant that means 'X cause Y to become a state'. The output of such a rule is by definition outside the lexicon, but the resulting derived words have to be inside the lexicon. This recurring dilemma is a consequence of what Langacker (1987) calls the "rule-list fallacy": the methodological assumption that if something is generated by rule, it cannot also be listed.

In order to capture less productive/nonproductive patterns, a schema-theoretic approach allows both productive and nonproductive schemas. The nonproductive schemas are not used generatively. Rather, they express the commonalities among items listed in the lexicon, and thus are used relationally. (2) shows a first approximation to the schemas under which the relations between three variants of the Urdu COS verbs fall. Each schema is a triplet of linked structures in semantics, syntax and phonology. The coindexation represents interface links within a structure as well as relational links across variants. $[_{V}V\,]$ in (2) represents a verb dominating another verb: the inner V is the base, and the outer V is the resulting complex word.

(2) a. Anticausative schema
Semantics: [BECOME[Y<*STATE*>]]$_{m}$
Morphosyntax: V_{m}
Phonology: /…/$_{m}$
b. Direct causative schema
Semantics: [[X ACT] CAUSE [BECOME[Y<*STATE*>]]$_{m}$]$_{n}$
Morphosyntax: $[_{V}V_{m}\ aff_{o}]_{n}$
Phonology: /…$_{m}$ a$_{o}$/$_{n}$
c. Indirect causative schema
Semantics: [[Z ACT] CAUSE [[X ACT] CAUSE [BECOME[Y<*STATE*>]]$_{m}$] $_{n}$]$_{p}$
Morphosyntax: $[_{V}V_{m}\ aff_{q}]_{p}$
Phonology: /…$_{m}$ va$_{q}$/$_{p}$

(2) represents productive schemas. In contrast, a nonproductive schema captures a pattern among items stored in the lexicon, but does not generate them and is not expectd to apply to every potential base. Rather, an item such as **bʊs-a* 'X cause Y to become stale' from *bʊs* 'Y become stale' 'Y become stale' which could fall under the direct causative schema simply is not listed and therefore is not used. Unlike a generative rule, a nonproductive schema does not have to specify every property of the items it relates. It just picks up commonalities and the idiosyncratic aspects such as a particular shade of meaning must be learned word by word; they are bits of structure that a traditional rule misses.

Figure 4.4 below represents a relation between an anticausative schema and a direct causative schema (sister schemas in Jackendoff & Audring's terms) of the Urdu COS verbs like *pək* that undergo *-a* suffixing for direct causativization. In a common-practice notation in Figure 4.4, the first line represents semantics, the second morphosyntax and the third phonology.

a. *pək* 'Y become cooked' → *pə.k-a* 'X cause Y to become cooked'

b. $\begin{bmatrix} [\text{BECOME } [\text{Y} < \textit{STATE} >]] \\ \text{V (int)} \\ /\text{A}/ \end{bmatrix} \leftrightarrow \begin{bmatrix} [[\text{X ACT}] \text{ CAUSE } [\text{BECOME } [\text{Y} < \textit{STATE} >]]] \\ \text{V (tr)} \\ /\text{A}a\ / \end{bmatrix}$

Figure 4.4 *Word-schemas and causative derivation*

The interaction between anticausative base schema and direct causative affix *-a* reflects semantic and syntactic effects of morphological causative derivation. The anticausative (intransitive) variant of an Urdu COS alternating verb *pək* 'Y become cooked' is equivalent to the morphological root of the verb and event-structurally means [BECOME [Y <*STATE*>]]. The direct causative variant *pə.k-a* means [X ACT] CAUSE [BECOME [Y<*STATE*>]]] and the indirect causative *pək.-va* means [Z ACT] CAUSE[X ACT] CAUSE [BECOME[Y<*STATE*>]]]]. The causative morphological operations (suffixing in the present case) add CAUSE functions to the anticausative variant, augmenting its semantics. Thus, word-schemas capture form-meaning

mapping (see Jackendoff & Audring, 2018, 2020). The comparison between Urdu WordNet plus Urdu Lughat data on the one hand and judgment data on the other hand (Table 4.4 above) also shows that the lexical schemas as general knowledge structures about the typical events are not rigid, but malleable and thus extendable to new cases (see Johnson, 1987 for image schema and meaningfulness). The morphological operations provide evidence that lexical schemas have sufficient internal structure to generate entailments and can be extended propositionally via schema transformations (see Lakoff, 1987 for image schema transformations such as path-focus to end-point focus, multiplex to mass, following a trajectory, superimposition, etc.). Thus, the direction of the causative derivation suggests how the alternants are conceptually related.

4.3 Morphological Operations: Morpholexical or Morphosyntactic?

Given that a morpheme is often viewed as a minimal Saussurean sign relating form and meaning, and that morphological operations concern the derivation of complex signs (Levin & Rappaport-Hovav, 2001), the question arises of whether the morphological operations detailed above are morpholexical, morphosyntactic or both, to use terms by Sadler and Spencer (2001), that is, if these operations derive new lexical semantic representations, new lexical syntactic representations called argument structures or both. As shown in Tables 4.2 and 4.3 above, the Urdu COS data reveals that an anticausative form is typically a morphologically simple predicate, and direct and indirect causatives are morphologically complex predicates. This implies that to make the effects of morphological operations more explicit, the first prerequisite is to find what lies in the simple predicate on which causativization process operates to produce complex predicates. Consider the anticausative use of the following Urdu COS verbs:

(3) a. loha pɪg^{h}l-a / pɪg^{h}əl gə-ya[23]

[23] As mentioned in Chapter 3, in Urdu-Hindi, a simple predicate like *pɪg^{h}əl* 'melt' can be substituted for a V_1 (main verb) - V_2 (light verb) complex predicate like *pɪg^{h}əl - jə* 'melt' where V_2 is inflected for tense, aspect and agreement

steel.M.3SG melt-PRF.M.3SG / melt.NFN go-PRF.M.3SG
'The steel melted.'

b. roti əkṛ-i / əkəṛ gə-i
bread.F.3SG stiffen-PRF.F.3SG / stiffen.NFN go-PRF.F.3SG
'The bread stiffened.'

c. zevrat ʊjl-e / ʊjəl gə-e
jewellry.M.3PL brighten-PRF.M.3PL / brighten.NFN go-PRF.M.3PL
'The jewelries brightened.'

As shown in (3), the Urdu COS verbs' anticausative forms such as *pɪg^{h}əl* 'Y become melt', *əkəṛ* 'Y become stiff', and *ʊjəl* 'Y become bright' are inflected for aspect, tense and agreement features of gender, number and person. They assume 'root+*A*' form where '*A*' vowel is realized as *a, e, ẽ* , *i,* or *ĩ,* depending upon agreement features. In this respect, the base anticausatives and derivative causatives behave identically. All the three COS verb variants, like other verbs in Urdu, can concatenate with light verbs in which case the main verb is in non-finite form and the above features appear on the light verbs, as shown in (3) above. The Urdu COS verbal roots are mono-morphemic in that they cannot be broken into smaller morphological units, as these roots have no internal morphological structure. So they are like English *break,* but unlike English *-ize* or *-ify* verbs (e.g., *concretize* and *solidify*) (see Levin, 1993), and Plains Cree verbal stem *pîkonam* 'break' that are morphologically complex. For instance, the predicate *pîkonam* 'x breaks y (inanimate)' is composed of three morphemes, the *root pîkw* 'break,' the transitive suffix *-(i)n* 'by hand,' and the inanimate "theme sign" *-am* (see Hirose, 2003). Unlike polysynthetic cases such as *pîkonam,* the Urdu verbal root is not overtly marked for transitivity as it does not carry any (in)transitivity marker, and its sole argument is lexically encoded. Evidence for this observation comes from the fact that the root form of an Urdu verb is typically used as a second singular imperative. In addition to an argument-taking ability, the anticausative root also possesses the properties of conceptual content and temporality which are, along with

---

features of gender, number and person. The two predicates constituting a complex predicate combine their argument structures to form a simple functional structure (see Butt, 1995).

argument-taking ability, considered necessary and sufficient conditions for predicatehood (see Hirose for defining properties of predicates). Since the present study assumes a distinction between conceptual structure (an extremely rich knowledge representation) and semantic structure (a subset of conceptual structure encoded in a linguistic form), a predicate is taken to encode semantic content, while a subset of lexical concepts serves as access sites to conceptual structure (see Barsalou, 2008; Evans, 2009). A predicate's semantic content refers to non-linguistic or real world information that makes us recognize a situation as hitting or breaking. In this sense, all Urdu COS verbal roots are semantically contentful. These verbal roots also possess the third defining property of a predicate, temporality, because they predicate events which, in turn, are characterized as spatiotemporal entities with aspectual dimension.

Having established that an Urdu COS anticausative form is a mono-morphemic predicate, the next step is to see how a causativization process manipulates information encoded in it to derive causative variants. Whether the morphological operation is concatenative, non-concatenative or trans-concatenative, the alternation is directed as shown in Table 4.1 above. Following Levin and Rappaport-Hovav (2001), these morphologically signaled relations can be defined over the two design components of lexical semantic representations of the COS verbs, that is, semantic roots and event schemas. The naming of the COS causative alternants illustrates this point: anticausative: [BECOME [Y <*STATE*>]], direct causative: [X ACT] CAUSE [BECOME [Y<*STATE*>]]], and indirect causative: [Z ACT] CAUSE [X ACT] CAUSE [BECOME [Y<*STATE*>]]]]. That is, morphological complexity reflects event schema complexity, and indirectly reflects argument structure complexity. This effect on the lexical syntactic side is due to the fact that the morphological processes operating on the anticausative base morphologically mark the CAUSE relation which is otherwise conceptually available but

not lexico-semantically encoded. The introduction of this CAUSE relation actually refers to a causative construal of the event, and needs one more subevent (causing subevent) in the case of direct causation, and two more subevents (causing as well as the intermediary) in the case of indirect causation. Thus the Urdu COS causative alternation is the case where morphological variants have distinct but related lexical semantic representation and argument structure. In other words, the causative derivation operates over lexical semantic representation as well as lexical syntactic representation. To illustrate, consider the following.

(4) a. dərəxṭ kəṭ-a
tree.M.3SG cut-PRF.M.3SG
'The tree got cut.'
b. bap=ne dərəxṭ kaṭ-a
father.M.3SG=ERG tree. M.3SG cut.CAUS^{d}-PRF.M.3SG
'The father cut the tree.'
c. bap=ne nɔkər= se dərəxṭ kəṭ-va-ya[24]
father.M.3SG=ERG servant.M.3SG=INS tree. M.3SG cut-CAUS^{ind}-PRF.M.3SG
'The father had the boy cut the tree.'

In (4a), the event structure of the anticausative *kəṭ* is [BECOME [tree <*CUT*>]]. When non-concatenative process (vowel-lengthening) operates on *kəṭ*, it converts *kəṭ* into direct causative *kaṭ* with event structure [[father ACT] CAUSE [BECOME [tree <*CUT*>]]]. Owing to this direct causativization of anticausative form *kəṭ*, the CAUSE relation is added to the otherwise anticausative lexical semantic representation. CAUSE being a two-place predicate requires another subevent as its argument ([father ACT]). When concatenative process *-va* suffixing operates on *kəṭ*, it converts *kəṭ* into indirect causative *kəṭva* with event structure [[father ACT] CAUSE [boy ACT] CAUSE [BECOME [tree <*CUT*>]]]]. A prototypical indirect

[24] An alternative analysis of this variant could use a silent impersonal subject *pro* as the causee. In that case, it would merely be a morphological, not a syntactic, omission. However, this study follows the Parallel Architecture where any hidden syntactic unit is avoided and the analysis is framed in terms of a flexible semantics-syntax interface.

causativization[25] process adds two CAUSE relations which require the addition of two new subevents as arguments: causing subevent [father ACT] and intermediary subevent [boy ACT].

The intermediary subevent, however, is syntactically omissible, structurally dispensable, if its own argument (causee) is indefinite in the context (see Kachru, 1976; Saksena, 1982c). For instance, *bap*=ne *dərəxṭ kəṭ-va-ya* 'the father had the tree cut' with two syntactic arguments is an acceptable use of indirect causative *kəṭva*, which is otherwise a 3-place predicate due to *-va* suffixing. This type of behavior found with the Urdu COS verbs provides empirical support that lexical semantic representation and lexical syntactic representation (argument structure) are distinct but related levels of lexical representation. That is, the encoding of arguments at a lexical semantic representation level and a lexical syntactic representation level (argument structure level) is not necessarily isomorphic. The syntactic omissibility of a semantically obligatory intermediary causee argument in the indirect causative constructions also indicates that the argument structure and syntactic features introduced by a causative morphological operation are not the same as those of independent causative verbs like English *make* (contra Marantz, 1984). This is so because a causative operation (e.g., *-va* suffixing), unlike *make*, allows the intermediary argument to be syntactically omissible. In such cases, the indirect causatives are two-place causatives in terms of addicity, though the intermediary causee remains present at semantic as well as conceptual levels due to the presence of *-va* causativizer. This observation about Urdu COS causatives concurs with Nedialkov and Silnitskii's cross-linguistic finding that a causal situation involves simple sub-situations (e.g., a causing situation and a caused situation) which are related by the causal link K (the CAUSE predicate in our terminology). No causal situation may lack any of these sub-situations and the elements therein, although causal

[25] In an indirect causative prototype, the verb is formally marked by *-va* suffix, and its valency increases from 1 to 3; semantically it introduces two subevents (cause (instigator) subevent and causee subevent) to an intransitive event.

constructions – the linguistic expression of causal situations – may lack one or more of these constituent components due to a "semantic ellipsis" operation which deletes elements from the causal situation (Nedialkov & Silnitskii, 1969 as cited in Wojcik, 1973). In this connection, we should also keep in mind that it is not a case where argument-taking items (e.g., base form and indirect causative affix *-va*) which are separate at the lexical semantic representation level but merge into a single entity at the argument structure level (such cases are discussed in Chapter 6).

Having established that morphological operations are both morpholexical and morphosyntactic, a pertinent question to be addressed here is what kinds of lexical distinctions are necessary to explain COS verbs' causative alternation behavior. The next section 4.4 deals with this aspect of the causative alternation.

4.4 Lexical Distinctions for the Causative Alternation

To find an explanatory relationship between a verb's meaning and its causative alternation behavior, Levin and Rappaport-Hovav (1995) propose a lexical distinction between internally caused verbs (verbs denoting internally caused events, i.e., some property inherent to the argument undergoing the change specified by the verb is "responsible" (p.91) for bringing about the event) and externally caused verbs (verbs denoting externally caused events, i.e., some cause external to the argument undergoing the change specified by the verb is responsible for bringing about the event). They argue that internally caused verbs (e.g., *bloom*) are lexically monadic and thus, do not alternate. In contrast, externally caused verbs imply an external cause and are thus lexically dyadic. Those externally caused verbs (e.g., *break*) which do not specify anything about the causing event participate in the alternation by undergoing a process of lexical binding of the external argument. However, those externally caused verbs (e.g., *murder*) which specify something about the causing event cannot undergo lexical binding, and thus do not participate in the alternation.

However, as shown by McKoon and Macfarland (2000), Wright (2002), Rappaport-Hovav and Levin (2012), and Rappaport-Hovav (2014a), some internally caused verbs do appear with cause subjects characterized as ambient conditions (e.g., *Early summer heat blossomed fruit trees across the valley.*), but not with agents or instruments (**The farmer/*the new fertilizer blossomed the fruit trees.*). Likewise, some externally caused verbs in English (e.g., *kill* and *destroy*) do not alternate despite the fact that they do not specify anything about the nature of the causing event. Such a behavior of verbs challenges the grammatical relevance of internal/ external causation distinction. Despite this challenge, as stated in Section 2.3, Alexiadou, Anagnostopoulou & Schäfer (2006) maintain the internal/external causation distinction in their four-way lexical semantic classification of roots/verbs:

(5) a. Agentive: (like *murder*) never alternate across languages – they are always transitive
b. Internal causation: (like *blossom* and *grow*) never alternate across languages – they are always intransitive
c. External causation: (like *kill* and *destroy*) – do not alternate in languages like English which do not mark the alternation morphologically, but do alternate in languages like Greek and Hebrew, in which the alternation is morphologically marked. In these latter languages, the intransitive variant is morphologically marked
d. Cause-unspecified: (like *break* and *open*) – alternate across languages: the suggestion is that when they are transitive they express external causation (as in (c) above) and when they are intransitive they express internal causation (as in (b) above).

(Alexiadou, Anagnostopoulou & Schäfer, 2006 as cited in Rappaport-Hovav, 2014a, p.19)

Contra Alexiadou et al., Rappaport-Hovav (2014a) discusses various asymmetries in the availability of the variants of COS verbs in English, and concludes that the lexical distinction between internal/external causation verbs is not relevant in that verbs in both classes alternate, though in different ways. She agrees with Alexiadou et al.'s observation that alternating verbs are lexically associated with internal arguments only, but argues that all alternating verbs are

unspecified for the type of causation. She also takes issue with Alexiadou et al's "cause-unspecified" category and observes that the very same change of state can be described using a verb which lexically selects a cause argument or by a verb which does not, as in (6).

(6) a. He died from exhaustion/the bullet wound.
b. Exhaustion/the bullet wound killed him.

(Rappaport-Hovav, 2014a, p.19)

Since (6a & b) describe the very same change of state brought about by the very same cause, it does not seem reasonable to assume that (6a) describes an event of external causation and (6b) an event of internal causation. Without assuming internal/external distinction, Rappaport-Hovav proposes a three-way lexical distinction among COS verbs:

(7) a. Verbs like *murder*, which specify something about the nature of the involvement of an external cause, are lexically associated with an argument representing the external cause, and this argument cannot be omitted
b. Verbs, like *kill* and *destroy*, which specify nothing about the nature of the causing event, but are nonetheless lexically associated with an argument representing the cause. Here, too, the argument cannot be omitted
c. All alternating verbs are lexically associated with the internal argument(s) only, namely, those involved in the specification of the nature of the change of state.

(Rappaport-Hovav, 2014a, p.21)

In alternating verbs, the causative alternation arises from the addition of a cause argument introduced under the Direct Causation Condition: "A single argument verb may be expressed in a clause with a transitive verb if the subject represents a direct cause of the event expressed by the verb and its argument" (Rappaport-Hovav & Levin, 2012, p.160). The notion of direct cause they make use of is taken from Wolff (2003): ''Direct causation is present between the causer and the final causee in a causal chain: (i) if there are no intermediate entities at the same level of granularity as either the initial causer or final causee, or (ii) if any intermediate entities that are

present can be construed as an enabling condition rather than an intervening causer'' (p.5 as cited in Rappaport-Hovav, 2014a). Rappaport-Hovav also discusses non-lexical factors governing the appearance of the cause argument for alternating verbs, but the present study, as mentioned in Chapter 2, focuses mainly on lexical factors. The following section explores if the above lexical distinctions account for the Urdu COS verbs' causative alternation behavior.

4.4.1 Urdu COS verbs and lexical distinctions

As mentioned in the previous sections in this chapter, with respect to asymmetries in the availability of the causative alternation variants, Urdu COS verbs fall into five subclasses: (a) anticausative-only , (b) direct-causative-only, (c) 2-variant (C^{anti} & C^{d}) alternating , (d) 2-variant (C^{d} & C^{ind}) alternating , and (e) 3-variant (C^{anti}, C^{d} & C^{ind}) alternating. These subclasses and the relevant lexical distinctions are discussed in sections 4.4.1.1–4.4.1.5 below.

4.4.1.1 Anticausative-only COS verbs.

The examples in (7) below represent the behavior of Urdu COS verbs that are typically used only anticausatively.

(8) a. ʊs=ka pet **əpʰər** gə-ya
he.M.3SG=GEN belly.M.3SG distend.NFN go-PRF.M.3SG
'His belly distended.'
b. kʰana **bʊs** gə-ya
food.M.3SG stale.NFN go-PRF.M.3SG
'Food staled.'
c. məriz=ki ãkʰẽ **pətʰra** gə-ĩ
patient.M.3SG=GEN eye.F.3PL petrify.NFN go-PRF.F.3PL
'The patient's eyes petrified.'
d. nəi kɔ̃plẽ **pʰuṭ-ĩ**
new bud.F.3PL bloom-PRF.F.3PL
'New buds bloomed.'
e. bəcce=ke gal **təm.tə.ma-e**
child.M.3SG=GEN cheek.M.3PL redden-PRF.M.3PL
'The child's cheeks reddened.'
f. pʰul **mʊrjʰa** gə-e
flower.M.3PL wither.NFN go-PRF.M.3PL
'Flowers withered.'

The anticausative-only COS verbs in (8) above can be easily characterized as internally caused verbs, and seem to be sensitive to the internal/external distinction, but there are certain cases that deviate from this distinction. For instance, *kʰɪl* 'bloom' can behave direct-causatively, though in such uses, like English *grow* (see Rappaport-Hovav, 2014a), it may not maintain the semantic distinction required of a causative alternation behavior: *V*-transitive means roughly 'cause to *V*-intransitive'. In such contexts, as in (9) below, *kʰɪl* may mean 'cultivate', not 'bloom'.

(9) a. bəhar a-i to kəlyã **kʰɪl** (Anticausative)
spring.F.3SG come-PRF.F.3SG then bud.F.3PL bloom.NFN
ʊṭʰ-ĩ
rise-PRF.F.3PL
'When spring came, buds bloomed.'
(adapted from Urdu WordNet)

b. vo zəmin mẽ pʰul **kʰɪl-a-ne**=ke (Direct causative)
he.M.3SG soil.F.3SG in flowe.M.3PL bloom-CAUS^{d}-INF=GEN
liye məsruf ho gə-ya
for busy be go-PRF.M.3SG
'He got busy with blooming flowers in the soil.'
(adapted from Urdu Lughat)

As evident from our comparison between Urdu WordNet and Urdu Lughat data on one hand and native speakers' judgments on the other, native speakers tend to extend the application domain of morphological operations. Consider the following examples.

(10) a. ləṛke dınõ mẽ **dʊbla** gə-e (Anticausative)
boy.M.3PL day.M.3PL in slim.NFN go-PRF.M.3PL
'The boys slimmed within days.'

b. vərzıʃ=ne ləṛkõ=ko **dʊbla** di-ya (Direct causative)
exercise.F.3SG=ERG boy.M.3PL=ACC slim.CAUS^{d} give-PRF.3PL
'The exercise slimmed the boys.'

(11) a. ʃərbət **kəṛva** gə-ya (Anticausative)
syrup.M.3SG bitter.NFN go-PRF.M.3SG
'The syrup became bitter.'

b. dəvasaz=ne ʃərbət **kəṛva** di-ya (Direct causative)
pharmacist.M.3SG=ERG syrup.M.3SG bitter.CAUS^{d} give-PRF.3PL
'The pharmacist made the syrup bitter.'

The examples in (10) and (11) above show that it is difficult to maintain that internally caused COS verbs never alternate. However, (11b) shows that even an agent may function as a cause argument for an internally caused verb in the sense that it provides enabling conditions for the event to take place. Apart from anticausative-only verbs, an anticausative variant in Urdu 3-variant alternating verbs allows an agent argument in a nonsubject position where it is marked with instrumental case *se*, as in (11) below:

(12) a. gılas lərke= se **ʈuʈ-a**
glass.M.3SG boy.M.3SG=INST break-PRF.M.3SG
'The glass got broken by the boy[26].'
b. cavəl ʊs= se **pək**-e
rice.M.3PL he.M.3SG=INST cook-PRF.M.3PL
'Rice got cooked by him.'
c. ek admi mʊj^{h}=se **məra**
one man.M.3SG I.ISG=INST die.PRF.M.3SG
'A man got killed by me.'

In such cases, the *se*-phrase introduces an agent without any causative morphological operation on the base form. In sum, the cases mentioned above resist the internal/external distinction, and also the accounts that exclude the possibility of an agent with anticausative variant.

4.4.1.2 Direct-causative-only COS verbs.

The examples in (13) below represent the behavior of Urdu COS verbs that are typically used only direct-causatively. The anticausative and indirect causative variants of these verbs were found neither in Urdu Lughat nor in Urdu WordNet.

(13) a. sərdi=ne pani=ko **bərf-a-ya**
cold.F.3SG=ERG water.M.3SG=ACC freeze-CAUS^{d}-PRF.3SG
'The cold froze water.'
b. jənretər=ne tarõ=ko **bərq-a-ya**
generator.M.3SG=ERG wire.F.3PL=ACC electrify-CAUS^{d}-PRF.3SG
'The generator electrified the wires.'
c. tərk^{h}an=ne ləkṛi=ka təxtəh **bərm-a**-ya
carpenter.M.3SG=ERG wood.F.3SG=GEN plank.M.3SG drill-CAUS^{d}-PRF.M.3SG

[26] As mentioned in Chapter1, the passive English gloss given here is not entirely accurate. The Urdu anticausative in fact has no passive interpretation.

‘The carpenter drilled the plank.’

d. mɛ̃=ne roti **bel**-i
I.1SG=ERG roti.F.3SG expand (with a rolling pin).CAUS^{d}-PRF.F.3SG
‘I expanded a roti (with a rolling pin).’

e. bəcce =ne pətte **cəb-a-e**
child.M.3SG=ERG leave.M.3PL masticate-CAUS^{d}-PRF.M.3PL
‘The child masticated (with teeth) the leaves.’

f. mã =ne ləṛki=ke liye roti
mother.F.3SG=ERG girl.F.3SG=GEN for roti.F.3SG
cur-i
break (into pieces).CAUS^{d}-PRF.F.3SG
‘The mother broke a roti into pieces for the girl.’

The causative-only Urdu COS verbs, as in (13), fit the characterization of externally caused verbs. The first four causative-only verbs given in (13a–d) do not seem to lexically specify anything about their cause arguments as they allow a range of causes, as shown in (14) and (15) for *bərfa* and *bel*.

(14) a. həm/fırıj/sərdi=ne pani=ko **bərf-a-ya** (Direct causative)
we/fridge/cold =ERG water.M.3SG=ACC freeze-CAUS^{d}-PRF.M.3SG
‘We/the fridge/the cold froze water.’

b. *pani **bərf-a-ya** (Anticausative)
water.M.3SG freeze-CAUS^{d}-PRF.M.3SG
‘Water became frozen.’

(15) a. mã/məʃin=ne roti **bel**-i (Direct causative)
mother/machine=ERG roti.F.3SG expand.CAUS^{d}-PRF.F.3SG
‘Mother/machine expanded a roti (with a rolling pin).’

b. *roti **bel**i (Anticausative)
roti.F.3SG expand.PRF.F.3SG
‘A roti expanded (with a rolling pin).’

However, out of the eight non-alternating direct-causative-only verbs in our 112- verb data set, the verb *cəba* ‘crush with teeth’ as in (12e) above describes an agent-motivated event, and is not expected to have its agent argument eliminated, as illustrated in (16).

(16) a. bəkri/*həva=ne pətte **cəb-a**-e
goat/wind=ERG leave.M.3PL masticate-CAUS^{d}-PRF.M.3PL
‘The goat/*wind masticated the leaves.’

b. *pətte **cəb-a-e**
leave.M.3PL masticate-CAUS^{d}-PRF.M.3PL

‘The leaves became masticated (with teeth).’

Despite its being agentive, Urdu Lughat does mention the intransitive form *cəb* of transitive *cəba* ‘masticate, crush with teeth’ (http://udb.gov.pk/result_details.php?word=100128).

Most of the verbs in the direct-causative-only category are either denominal (e.g., *bərfa* from *bərf* ‘ice’, *bərqa* from *bərq* ‘lightening/electricity’ and *bərma* from *bərma* ‘drill’), or deadjectival (e.g., *cur* ‘break into pieces’ from *cur* ‘state of being in pieces’). These verbs also have ‘N-V’ and ‘Adj-V’ complex predicate versions, respectively. An interesting case is the verb *cur* ‘break into pieces’; it has no intransitive variant in its simple predicate form, as shown in (17b) below, but in its complex predicate version (Adj-V=ho/kər[27]), as in (18) below, it shows alternation, patterning like other similar complex predicates. In its ‘Adj-V’ anticausative use, this verb leaves its cause argument unexpressed.

(17) a. mã=ne lərḳi=ke liye roti
mother.F.3SG=ERG girl.F.3SG=GEN for roti.F.3SG
cur-i
break(into pieces).CAUS^{d}-PRF.F.3SG
‘The mother broke roti into pieces for the girl.’
b. * roti **cur**-i
girl.F.3SG=GEN for roti.F.3SG break(into pieces)-PRF.F.3SG
‘The roti broke into pieces for the girl.’

(18) nəsir=ne gılas xali kər ke bʊrj mohən=ke gılas pər
naseer.M.3SG=ERG glass empty do CPM rod mohan=GEN glass on
de mara, donõ ek ʃənake=ke sat^{h} **cur** **ho** gə-e
give strike both one noise=GEN with break (into pieces) be go-PRF.M.3PL
‘Having emptied the glass, Naseer struck Mohan’s glass with rod and both broke into pieces with a loud noise.’
(Urdu Lughat: http://udb.gov.pk/result_details.php?word=93264)

This particular behaviour of *cur* seems to resist the observation that verbs with lexically specified cause argument cannot leave their cause argument unexpressed, and thus cannot

[27] *ho* ‘be/become’ is a light verb functioning as an intransitive marker and *kər* ‘do’ is a light verb functioning as a transitive marker in ‘Adj-V’ type complex predicate. This type of complex predicate differs in its behavior from a ‘V_1-V_2’ type aspectual complex predicate discussed in Chapter 3 because in the former cases, the adicity is typically determined compositionally.

alternate. If the base form of *cur* lexicalizes a particular change of state along with two arguments (cause and patient), it is not expected to eliminate its cause argument, whether it is used in simple predicate form or complex predicate form, as is the case with other simple predicates that have 'Adj-V' complex predicate versions as well. For instance, the deadjectival non-agentive COS verb *nərma* 'soften' has both intransitive and transitive 'Adj-V' complex predicate versions *nərm ho/kər* 'become/cause to become soft'. However, unlike *cur*, *nərma* in its simple predicate form shows alternation as in (18), confirmed by judgment data.

(19) a. jũhi am **nərma-e** həm=ne (Anticausative)
as soon as mango-M.3PL soften-PRF.M.3PL we=1PL=ERG
k^ha li-ye
eat.NFN take-PRF.M.3PL
'As soon as the mangoes softened, we ate (them).'
b. həm=ne pehle amõ=ko **nərma-ya** (Direct causative)
we.1PL=ERG first mango.M.3PL=ACC soften.CAUS^d-PRF.M.3PL
'We first softened the mangoes.'

The behavior of causative-only COS verbs in Urdu as pointed out above presents difficulty for those accounts which explain the non-alternating behavior of COS verbs in terms of the lexical specification of cause argument and agentivity.

4.4.1.3 2-Variant (C^{anti} & C^{d}) alternating COS verbs.

The examples in (20) below represent the behavior of Urdu COS verbs that are typically used alternatingly: they have anticausative and direct causative variants, but not indirect causative variant, as our Urdu Lughat data confirms.

(20) a. əkəṛ 'stiffen'
i. roti **əkəṛ** gə-i (Anticausative)
roti.F.3SG stiffen.NFN go-PRF.F.3SG
'The roti stiffened.'
ii. izza=ne roti **əkṛ-a** di (Direct causative)
Izza.F.3SG=ERG roti.F.3SG stiffen-CAUS^d give.PRF.F.3SG
'Izza stiffened the roti.'
b. bıgəṛ 'worsen'
i. məriz=ki sehət **bıgəṛ** gə-i (Anticausative)

patient.M.3SG=GEN health.F.3SG worsen.NFN go-PRF.F.3SG
'The patient's health worsened.'

ii. məriz=ne sıgrıṭnoʃî=se sehət **bıgaṛ** (Direct causative)
patient.M.3SG=ERG smoking.F.3SG=INST health.F.3SG worsen.CAUS[d] li
tak.PRF.F.3SG
'The patient worsened (his) health by smoking cigarettes.'

c. xəm 'bend, twist'

i. ləmba paıp **xəm** gə-ya (Anticausative)
long pipe.M.3SG bend.NFN go-PRF.M.3SG
'The long pipe bent.'

ii. karigər=ne paıp **xəm-a-ya** (Direct causative)
workman.M.3SG=ERG pipe.M.3SG bend-CAUS[d]-PRF.M.3SG
'The workman bent the pipe.'

d. sʊkəṛ 'shrink'

i. parah sərdi mẽ **sʊkəṛ** gə-ya (Anticausative)
mercury.M.3SG cold in shrink.NFN go-PRF.M.3SG
'The mercury shrank in the cold.'

ii. sərdi=ne pare=ko **sʊkeṛ** di-ya (Direct causative)
cold.F.3SG=ERG mercury.M.3SG=ACC shrink.CAUS[d] give-PRF.3SG
'The cold shrank the mercury.'

e. suk[h] 'dry'

i. tɔliyəh **suk[h]** gə-ya (Anticausative)
towel.M.3SG dry.NFN go-PRF.M.3SG
'The towel dried.'

ii. mɛ̃=ne pəñk[h]e=se tɔliyəh **sʊk[h]-a-ya** (Direct causative)
I.SG=ERG fan.M.3SG=INST towel.M.3SG dry-CAUS[d]-PRF.M.3SG
'I dried the towel with fan.'

In these alternating verbs, the base anticausative form of a COS verb is lexically associated with only a patient argument, and the causative alternation arises from the addition of a cause argument introduced via a direct causative morphological operation. Now the question arises why these Urdu verbs do not have indirect causative variants such as *əkəṛ → əkəṛva*, *bıgəṛ → bıgəṛva*, *xəm → xəmva*, *sʊkəṛ → sʊkəṛva*, *and suk[h] → suk[h]va*, following typical indirect causativization processes in Urdu. There seems to be no semantic/conceptual blocking that disallows the introduction of an instigative cause argument (indirect causer) and intermediate causee via indirect causativization because a lexically unspecified causee is fully eligible to participate in the events described by the base verb forms. That is why, a number of our

questionnaire respondents tend to use the indirect causative variants of these base verbs. However, there may be certain patient arguments whose semantics disallows an intermediary causee introduced by an indirect causativization process. Consider the examples in (21).

(21) a. ʊs=ki ak̃^{h}ẽ **sʊkṛ-ĩ** (Anticausative)
he.M.3SG=GEN eye.F.3PL shrink-PRF.F.3PL
'His eyes shrank.'
b. ʊs=ne əpni ak̃^{h}ẽ **sʊkeṛ-ĩ** (Direct causative)
he.M.3SG=ERG self eye.F.3PL shrink.CAUS^{d}-PRF.F.3PL
'He shrank his eyes.'
c. *ʊs=ne əpni ak̃^{h}ẽ nərs=se (Indirect causative)
he.M.3SG=ERG self eye.F.3PL nurse.F.3SG=INST
sʊkəṛ-va-ĩ
shrink-PRF.F.3PL
'He had a nurse shrink his eyes.'

(21c) is not conceptually possible in this case because the act of shrinking eyes defies an indirect causation. This is the reason that glasses/contacts can be involved in shrinking eyes due to their direct involvement in the act of shrinking. The lexical distinction accounts discussed above do not accommodate such cases of indirect causation.

4.4.1.4 2-variant (C^{d} & C^{ind}) alternating COS verbs.

The examples in (22) below represent the behavior of Urdu COS verbs that are typically used alternatingly. These verbs alternate only in direct causative and indirect causative variants, but lack an anticausative variant, as in evident in Urdu Lughat data.

(22) a. cãḍ 'flatten'
i. karigər=ne loha **cãḍ** di-ya (Direct causative)
workman.M.3SG=ERG iron.M.3SG flatten.CAUS^{d} give-PRF.M.3SG
'The workman flattened the iron.'
ii. həm=ne karigər=se loha **cãḍ-va-ya** (Indirect causative)
we.1PL=ERG workman.M.3SG=INST iron.M.3SG flatten-CAUS^{ind}-PRF.M.3SG
'We had the workman flatten the iron.'
b. cit^{h} 'crush with teeth'
i. ləṛki=ne əlaıci **cit^{h}-i** (Direct causative)
girl.F.3SG=ERG cardamom.F.3SG flatten (with teeth).CAUS^{d}-PRF.F.3SG
'The girl flattened the cardamom with (her) teeth.'
ii. ləṛki=ne mã=se əlaıci (Indirect causative)

girl.F.3SG=ERG mother.F.3SG=INST cardamom.F.3SG
cit^{h}-va-i
flatten (with teeth)-CAUS^{ind}-PRF.F.3SG
'The girl had the mother flatten the cardamom.'

c. d^{h}ən 'card cotton'

i. bap=ne kəpas **d^{h}ən-i** (Direct causative)
father.M.3SG=ERG cotton.F.3SG card.CAUS^{d}-PRF.F.3SG
'The father carded the cotton.'

ii. ləṛki=ne həm=se kəpas (Indirect causative)
girl.F.3SG=ERG we.1PL=INST cotton.F.3SG
d^{h}ən-va-i
card-CAUS^{ind}-PRF.F.3SG
'The girl had us card the cotton.'

These COS verbs show alternation only in direct and indirect causative variants, and have no anticausative variants, which otherwise serve as base for causative derivation. These verbs, like non-alternating direct-causative-only verbs, seem to be lexically associated with the cause argument, but specify nothing about it, with one exception *cit^{h}* 'crush with teeth'. However, unlike direct-causative-only verbs, these verbs alternate for indirect causative variant. Why? Because the semantics of the patient arguments seems to accept indirect causation. If the direct cause argument is lexically specified, it is not expected to be eliminated in any case. However, this direct cause argument is omissible when it appears as an intermediary cause in an indirect causative variant, as discussed below in (23). These alternating COS verbs, thus, pattern like 3-variant alternating COS verbs in not allowing the omission of the subject which is a "noninvolved causer" (Saksena, 1982c, p.2), but allowing the omission of the intermediary causee, which is otherwise directly involved in the event. Unlike other verbs in this set, *cit^{h}* 'crush with teeth' in (22b) above is an agentive verb, and thus resists the elimination of its agent argument, but allows the involvement of any intermediate agentive causee that shows semantic compatibility with the verb, as in (23c).

(23) a. həm=ne loha **cãḍ-va-ya** (Indirect causative)
we.1PL=ERG iron.M.3SG flatten-CAUS^{ind}-PRF.M.3SG
'We had the iron flatten.'
b. ləṛki=ne əlaıci **cit^{h}-va-i** (Indirect causative)
girl.F.3SG=ERG cardamom.F.3SG flatten (with teeth)-CAUS^{ind}-PRF.F.3SG
'The girl had the mother flatten the cardamom.'
c. ləṛki=ne kəpas **d^{h}ən-va-i** (Indirect causative)
girl.F.3SG=ERG cotton.F.3SG card-CAUS^{ind}-PRF.F.3SG
'The girl had the cotton carded.'

This kind of behavior is difficult to account for in terms of the Direct Causation Condition, as proposed by Rappaport-Hovav and Levin (2012).

4.4.1.5 3-variant alternating COS verbs.

The examples in (24) below represent the behavior of Urdu COS verbs that alternate in all the three possible variants in Urdu: anticausative, direct causative and indirect causative variants.

(24) a. mər 'die'
i. aj hadse mẽ ek admi **mər-a** (Anticausative)
today accident in one man.M.3SG die-PRF.M.3SG
'Today a man died in an accident.'
ii. ek qɛdi=ne do admi **mar-e** (Direct causative)
one prisoner.M.3SG=ERG two man.M.3PL kill.CAUS^{d}-PRF.M.3PL
'A prisoner killed two men.'
iii. jagirdar=ne əpne admiyõ=se vəkil=ko (Indirect causative)
landlord.M.3SG=ERG self man.M.3PL=INST lawyer.M.3SG=ACC
mər-va-ya
kill-CAUS^{ind}- PRF.M.3SG
'The landlord had his men kill the lawyer.'
b. kəṭ 'cut'
i. dərəxt **kəṭ-e** (Anticausative)
tree.M.3PL cut-PRF.M.3PL
'The trees got cut.'
ii. mali=ne dərəxt **kaṭ-e** (Direct causative)
gardener.M.3SG=ERG tree.M.3PL cut.CAUS^{d} -PRF.M.3PL
'The gardener cut the trees.'
iii. malık=ne mali=se dərəxt (Indirect causative)
owner.M.3SG=ERG gardener.M.3SG=INST tree.M.3PL
kəṭ-va-e
cut-CAUS^{ind}-PRF.M.3PL
'The owner had the gardener cut the trees.'
c. ṭuṭ 'break'
i. bərtən **ṭuṭ-e** (Anticausative)

pot.M.3PL break-PRF.M.3PL
'The pots broke.'

ii. cəpṛasi=ne bərtən **toṛ-e** (Direct causative)
peon.M.3SG=ERG pot.M.3PL break.CAUS^{d}-PRF.M.3PL
'The peon broke the pots.'

iii. əfsər=ne cəpṛasi =se pʊrane bərtən (Indirect causative)
officer.M.3SG=ERG peon.M.3SG=INST old pot.M.3PL
təṛ-va-e
break-CAUS^{ind}-PRF.M.3PL
'The officer had the peon break the old pots.'

These are regular cases of the causative alternation in Urdu COS verbs where, as discussed earlier, an anticausative is basic, and direct and indirect causative variants are derived via morphological operations. The regular alternating verbs are lexically associated with the patient argument only and the alternation arises from the addition of a cause argument which is lexically unspecified. However, there are certain cases that carry crosslinguistically relevant implications. For instance, unlike English, Urdu correspondents of *kill* and *cut*, as shown in (24) above, participate in the causative alternation. This behavior challenges Alexiadou et al.'s (2006) generalization that externally caused verbs like *kill* and *destroy* do not alternate in languages like English, which do not mark the alternation morphologically, but do alternate in languages like Greek and Hebrew, in which the alternation is morphologically marked. In these latter languages, the intransitive variant is morphologically marked. Contra Alexiadou et al.'s observation, Urdu correspondents of these verbs do alternate despite the fact that intransitive variant is basic and transitive variants are morphologically marked. As to the English agentive verb *murder*, it has no simple predicate equivalent in Urdu, but assumes the 'Noun-V' complex predicate form (*qətəl ho/kər* 'be/cause to be murdered' which can be used both transitively as well as intransitively.

To summarize, from the above discussion, it follows that Urdu COS data, in part, confirms Rappaport-Hovav's (2014a) three-way distinction in the domain of COS verbs, as

mentioned above. Some COS verbs lexically specify the cause argument as the agent argument. Though these verbs do not alternate in English, they do so in Urdu. A small number of Urdu COS verbs are associated with the cause argument but do not lexically specify the cause argument, and nonetheless do not alternate. From this, it follows that agentivity does not seem to play a crucial role in Urdu COS verbs' causative alternation in particular. And all alternating COS verbs are lexically associated with the internal argument(s) only, namely, those involved in the specification of the nature of the change of state.

However, the divergent behavior of COS verbs in Urdu raises a main question: Why do Urdu COS verbs behave the way thay do with respect to the causative alternation? More specifically, the following issues need to be addressed:

i. Why do some COS verbs behave only anticausatively?

ii. Why do some COS verbs behave only direct-causatively?

iii. Why do some COS verbs behave anticausatively and direct-causatively but not indirect-causatively?

iv. Why do some COS verbs behave direct-causatively and indirect-causatively but not anticausatively?

The lexical distinction accounts given above do not appear sufficient for two main reasons. First, they do not provide motivation for why these lexical distinctions exist in the first place, that is, why these lexical distinctions are relevant to causal meanings, and where these causal meanings come from. Second, they provide no obvious way to capture the direct/indirect causation distinction which is grammatically relevant in Urdu. Hence, they call for theoretical extension to account for the whole range of causative phenomena in languages like Urdu. This study argues that the issues raised above can be addressed when lexical distinctions are recast in terms of the notion we call "Causal Responsibility" which is elaborated in the next section. The primary

motivation behind this notion is to avoid a "hands-off approach to the meaning of causation" (Copley & Wolff, 2014, p.11) and explore the relevant causal meanings that might afford a deeper understanding of the lexical semantics-syntax interface and its underpinnings in conceptual structure. The idea here will be that the argument structure properties derive from the causal responsibility relation represented in a COS event.

4.4.2 Causal responsibility: an alternate proposal.

The present study borrows the term "Causal Responsibility" (CR) from Kistler (2006), defines it in terms of Mumford & Anjum's (2011) causal powers, and then, operationalizes it in terms of Rappaport-Hovav and Levin's (1998a) lexical decomposition and Evans' (2009, 2015) lexical profile. Kistler proposes a transmission theory of causation:

> "Two events c and e are related as cause and effect if and only if there is at least one physical quantity P, subject to a conservation law, exemplified in c and e, of which a determinate quantity is transferred between c and e" (p.9).

In the context of causal explanation (statement), Kistler introduces the concept of "causal responsibility" to mention properties of cause and effect events, which "brings into play the fact that the cause event c possesses a property F that is efficacious in bringing about the effect, and the fact that the effect e possesses a property G by virtue of the influence of the cause" (p.10). Kistler adds that causal responsibility does not directly relate c and e, but relates certain facts about them, and causal statements must express the relation of causal responsibility. To illustrate, the factive expression *Her performing the song surprised me* states the relation of causal responsibility, but the eventive expression *The performance of the song surprised me* states the relation of causation (Kistler, 2014).

The present study concurs with Kistler's characterization of causation as a transmission of some conserved property, but deviates from it in two respects. First, it directly relates the notion of causal responsibility to the causally associated subevents within a COS event denoted by a COS verb. Second, instead of characterizing causation in terms of the transmission of conserved quantities such as energy and force between c and e, the present study, following Mumford and Anjum (2011), views the transmission of a conserved property in terms of causal powers: the ability of entities to transmit or receive a conserved quantity. The choice of causal powers lies in the understanding that COS events, as defined in Chapter 3, and the semantics of COS verbal domain can be better analysed in terms of causal powers, and, as discussed below, this type of analysis has a better chance of informing the semantic theory by explicating the mapping between conceptual causal structure and semantic causal structure as represented in language. For instance, the theory of causal powers as a dispositional theory of causation may help to link under disposition (as a property of the causal structure, as pointed out by Copley & Wolff (2014)) the ability of animate agent (volitionality/intentionality) and inanimate causers to be the external arguments, the behavior we see in Urdu COS verbs in section 4.4.1.1.

According to Mumford and Anjum (2011), causation is a relation between the relata's properties whose mutual manifestation is an effect. Instead of thinking, for instance, of water having a power to dissolve salt, we should think of water and salt as mutual manifestation partners whose manifestation is the production of saline solution. Causation occurs and an effect emerges when the causally responsible properties (causal powers) of the relata work in tandem. These properties exercise themselves only when a causally active property is compatible with a causally receptive property, as in the saline example above. The same causal power (a causally active property that disposes towards an effect in some direction) can produce different overall

effects depending on which other powers combine with it, and which receptive property it engages in a causal transaction. Depending on its partnerings, for instance, heat can produce expansion, melting, boiling, steam, burning, pleasure, pain, life, death, etc. An effect as a mutual manifestation of the causal abilities of the relata[28] binds them in what the present study calls a "Causal Responsibility" relation[29], and defines it as:

(25) Causal Responsibility (CR) refers to a relation that holds between event participants' properties, indicating their asymmetric involvement in the event and is disposed towards an effect which is a mutual manifestation of those properties.

This definition of CR implies that what is important at the level of conceptual causal structure must be visible to language at the lexical semantics-syntax interface. For instance, a causal event of melting as in *The chemist melted the gold* specifies an asymmetric relationship holding between the causing subevent [X ACT] and resulting subevent [BECOME [Y < MELTED>]] with respect to their CR. The causally active argument *the chemist* in the causing subevent assumes the status of a cause argument, and the causally receptive argument *the gold* in the resulting subevent assumes the status of a patient argument. This asymmetry in the event participants' involvement in the event allows asymmetry in the possible perspectives on the causal relation (see Barsalou, 1999, 2003 for componential nature of perceptual representation), that is, whether it is viewed from the causing subevent perspective [X ACT] or from the resulting subevent [BECOME [Y< MELTED>]] perspective, and for that matter, from the cause or patient argument perspective.

[28] Typically causation involves the properties of two different entities; however, there may be a causal relation where different properties of the same entity are elated in a causation disposed towards an effect. In the latter case, the causation is traditionally called internal causation.

[29] The event representation proposed here makes no claim to correspond to the real world's laws of physics. As Ramchand (2014) points out, "What we are modeling is our own human cognitive structuring of the event domain" (p.265). "In general, the relation between the linguistic description of events and the events taking place in the real world is mediated by the human cognitive construal of events, which is what we take our lexical semantic representations to represent" (Levin & Rappaport-Hovav, 1995, p.99).

In the context of a COS event[30], a causally receptive entity has an initial state (a property which is part of its ontological status). This entity undergoes a state change under an external/internal triggering influence (a causal power), attaining another state. A COS verb as a linguistic entity predicates a COS event and lexicalizes, schematically, either the whole or a part of whatever is involved in an entity's transition from an initial state to a new (result) state. A lexical semantics-syntax theory of COS verbs is to characterize what it is in a COS event that a COS verb represents and how this representation relates to its syntactic realization. The present study argues that a COS verb's lexical semantics and syntax are sensitive to asymmetries in the CR relation and other associated properties characteristic of a COS event. This is evident in a COS verb's event structure and lexical profile. To elaborate the manifestation of CR in a COS verb's event structure and lexical profile, this study draws on the type of event structure (root-event schema based) as proposed in Rappaport-Hovav and Levin (1998a), and on the notion of lexical profile as proposed in Evans (2009).

In Rappaport-Hovav and Levin's proposal on event structure, as stated in Chapter 2, a verb lexicalizes only some of the attributes of an event, and thus provides a specific construal of that event. The set of event attributes a verb lexicalizes as its meaning can be organized in a bipartite, hierarchical structure: a part that distinguishes among the class members and thus idiosyncratic to each member is referred to as "root", and a part shared by all members of the same verb class is referred to as "event schema". The event schema is the structural component of verb meaning, and is defined in terms of primitive predicates (ACT, CAUSE, BECOME,

[30]This study follows Levin and Rappaport-Hovav (1999) in assuming that in the complex flow of happenings in the world, what can be considered an event is a matter of construal reflected in the properties lexicalized in verbs: a verb lexicalizes a set of properties which are temporally anchored and a happening in the world with this set of properties is considered to be an event. It also assumes that verb semantics (the lexicalized set of spatiotemporal properties of event) being relational is rich enough to lexically entail nominal concepts associated with arguments (entity-related concepts) predicated of by verb. This conception of event-verb relation is relevant to the notion of causal responsibility in COS domain, a notion central to the present analysis of event structure and argument realization.

STATE, etc.) chosen to represent grammatically relevant meaning components shared by all members of the same verb class. An event schema, through its primitive constituents, defines the aspectual and causal structure of the event, and a root fills in the real-world details of the event schema, as shown in the lexical decomposition of a transitive COS verb given in (26).

(26) a. [X ACT] CAUSE [BECOME [Y < *STATE*>]]]

b. break: [X ACT] CAUSE [BECOME [Y < *BROKEN*>]]]

That verb meaning contains linguistically significant hierarchal structure is indicated by bracketing in the event structure. The state primitive STATE and activity primitive ACT are basic building blocks and more complex event structures are generated by combining causative primitive CAUSE and change of state primitive BECOME. The CAUSE serves as a function and takes causing subevent ([x ACT]) and resulting subevent ([BECOME [y < *STATE*>]]) as its arguments arranged hierarchically, which indicates an asymmetric CR relation between them, in terms of the CR account proposed here. In addition, (26) above captures the event construal from the perspective of a causing subevent, while (27) below describes a resulting subevent:

(27) [BECOME [y < *STATE*>]]

The asymmetry in CR between the subevent structures thus finds expression in the hierarchical structure of meaning components in a verb's lexical semantic representation.

In addition to a causative verb's lexical semantic representation, the asymmetry in a CR relation between the subevent structures (and for that matter, between the event participants) is also evident in a verb's lexical profile: semantic and formal selectional tendencies encoded by a lexical concept associated with a verb as a phonological form. The following account of lexical profile draws on Evans (2009, 2015). According to Evans, lexical forms encode lexical concepts, and most lexical concepts have selectional tendencies. The selectional tendencies are the range of

other lexical concepts and forms with which a particular lexical concept can co-occur. It is these selectional tendencies of a lexical concept which make up its lexical profile. A lexical profile comprises two types of selectional tendencies: semantic and formal. Semantic selectional tendencies have to do with the lexical concepts with which a lexical concept co-occurs and in which it can be embedded. Formal selectional tendencies concern the lexical form with which a given lexical concept co-occurs, or in which it can be embedded. To illustrate, consider the semantic selectional tendencies associated with the lexical concept encoded by an Urdu direct causative *pəka* 'cook':

(28) a. izza=ne cavəl pək-a-e
izza.F.3SG=ERG ric.M.3PL cook-CAUS^{d}-PRF.M.3PL
'Izza cooked rice.'
b. [X ACT] CAUSE [BECOME [y < *STATE*>]]]

(28b) represents an event-based lexical decomposition of *pəka*. A complex lexical concept [X ACT] CAUSE [BECOME [Y < *STATE*>]]] selects for two semantic arguments (X and Y) that can be construed as a cause and a patient associated with causing subevent [X ACT] and resulting subevent [BECOME [Y < *STATE*>]] respectively. So part of our knowledge concerning this complex lexical concept involves knowing what kinds of lexical concepts it can co-occur with. More specifically, if a verb's semantics contains a CAUSE function, it always relates two arguments with respect to their CR in the event described by the verb. In terms of formal selectional tendencies, part of our knowledge of the same lexical concept involves, for instance, knowing how the lexical forms associated with the cause and patient lexical concepts occur with respect to the lexical form *pəka*. Together these two types of knowledge form the lexical profile for the lexical concept [X ACT] CAUSE [BECOME [Y< *STATE*>]]].

In addition, formal selection tendencies needn't be restricted to knowledge of word order. It can also include knowledge concerning the nature of the permissible lexical forms that can co-

occur with a given lexical concept. For instance, the lexical concept associated with *pəka* selects for a direct object as in (28a) above, but not for a sentential complement as in **izza=ne pəkae kıh yıh cavəl hɛ̃* 'Izza cooked that these are rice'. Thus, a lexical profile (a lexical concept's selectional tendencies) constitutes a lexical concept's use potential. One consequence of lexical concepts encoding a lexical profile as part of their linguistic knowledge bundle is that lexical concepts can be combined, and they are combined in nested fashion. To sum, a COS verb's lexical semantics encodes the CR relation between the event participants and also allows construals of the event from the perspectives of both causing and resulting subevents. And all this is evident in a COS verb's event structure and lexical profile.

In a COS event, a cause argument's CR refers to its potential to elicit a response from its mutual manifestation partner (typically a patient argument with a causally receptive property), while a patient argument's CR is its potential to respond to a cause argument's causally active property which disposes to trigger an effect. The present study argues that though a result state in a COS event is a mutual manifestation of both the cause and patient arguments' CR properties, it is the patient argument which is more involved in the event in that most of the attributes of a COS event that inform a COS verb's semantic content belong to the patient argument. It is a patient argument's CR that Reinhart (2000, 2016) takes to be an enabling condition associated with an internal argument of a verb necessary for the denoted event to take place. The essential role of a patient argument in defining a COS verb becomes more clear when the subevent structure[31] of a typical COS event is viewed in terms of the CR relation. A COS event shows a

[31] Being conceptually causative, a COS verb also encodes a temporal relation between the subevents which is characterized by the following properties: (a) the subevents need not be temporally dependent, (b) the result subevent cannot begin before the causing subevent, (c) only the result subevent can bound the event as a whole, and (d) there is no intervening event between the causing subevent and the result subevent; that is, causation is direct (Rappaport-Hovav & Levin, 2001). This study assumes that in COS domain, event complexity can be explained in terms of causal responsibility (see Chapter 4).

causal relation between two subevents: a cause (c) subevent makes an effect (e) subevent happen. The subevents c and e within a COS event E are related as cause and effect in that at c, a particular activation (by a cause which may be external or internal) of at least one efficacious, intrinsic property P of the patient participant (energy/force recipient) undergoing E leads to e where the patient comes to be in a final physical state s_f different from the previous initial state s_i. Thus, a COS causal relation presupposes the existence of some CR properties, which make c cause e by bringing into play the following facts: (a) the patient participant at the temporal phase of c possesses a property (being in a state which is causally receptive) that can realize the effect when activated by a cause argument's causally active property; (b) due to activation at c, this effect emerges as a state change in the patient participant at the temporal phase of e; (c) both c and e subevents concern the same property of the patient participant which undergoes a change at e phase, that is, either it assumes a different value or exists no more. Thus, the CR property of the patient is basic to both subevents, and the causal relation comes into being when the intrinsic property of the patient at c gets activated to produce the effect, satisfying other conditions required for e to occur, which vary across individual events. This account implies that one can characterize both subevents in terms of change in the patient's CR property.

In the light of the above discussion, the study argues that the CAUSE predicate in a COS verb's lexical decomposition specifies the CR relation between the subevent structures (and for that matter between the event participants) in a causal event described by the verb. It relates all other basic building blocks of a COS event – ACT, BECOME and STATE (aspectual aspects of a COS event) – in a hierarchical fashion. It is in this way that the event-verb relation can be more explicitly characterized, that is, what it is in a COS event that a COS verb represents. Whether a causal relation is direct or indirect, what counts is the CR relation between the relata. As to the

anticausative variant of a COS verb, it is just one construal of a COS event from the perspective of a resulting subevent where the CAUSE relation is available at a conceptual level but not at lexical semantic level. The asymmetric involvement of the event participants in a COS event as suggested by a COS verb's event structure and lexical profile also confirms that a patient is more involved in a COS event than a cause.

The generative tradition takes causation as a primitive relation CAUSE and treats CAUSE as if it were referentially and conceptually bleached, and thus obscures the roles of causal concepts in language (Copley & Wolff, 2014). Moreover, a lexical decomposition without a theory of reference is more likely to be vacuous since, without a theory of reference, one cannot know whether or not a particular semantic primitive is part of the lexical semantic representation of a particular word (Dowty, 1979; Koontz-Garboden, 2007). So the semantic primitive CAUSE should be given some substance. This can be done by considering the properties that relate their bearers causally and also the properties that are commonly associated with a causal relation such as temporal precedence/simultaneity, spatial contiguity, transmission of conserved quantities such as force/energy, etc. (see Kistler, 2006). To make CAUSE more concrete, the present study takes CAUSE to represent a CR relation.

CR also helps identify types of causation in terms of the event participants' extent of involvement in the event. The causally responsible properties of event participants may be of two main types: those which are directly involved and those which are indirectly involved in a causal interaction. The directly involved properties are either active or receptive, and the indirectly involved properties are only instigative in character. Hence, CR relates three different types of properties (P^a=active property, P^i=instigative property and P^r=receptive property) with respect to

their asymmetric involvement in a COS event. The asymmetric involvement of these three types of properties may result in the following possible interactions:

(29) a. $P^a \times P^i$

b. $P^a \times P^r$

c. $P^i \times P^r$

d. $P^i \times P^a \times P^r$

Out of these possible interactions, CR precludes (29a) and (29c) because it conditions a causal interaction with the obligatory involvement of both P^a and P^r at conceptual level: no causal relation is possible without the mutual manifestation of P^a and P^r. Therefore, the involvement of P^i without P^r, as in (29a), or without P^a, as in (29c), will not produce any CR relation. Out of the remaining two interactions, (29b) represents a conceptually possible direct causation, and (29d) represents an indirect causation. In this way, CR differentiates direct from indirect causation, that is, whether an active property is directly involved or mediated by an instigator.

Since CR captures the asymmetric involvement of active, instigative and receptive properties, it predicts three possible subevent structures: causing subevent, resulting subevent, and instigating subevent. An instigating subevent has a limited involvement in the mutual manifestation of interacting properties in the CR relation. Nonetheless, it is a causal possibility and has morphosyntactic realization in Urdu. By relating the asymmetric involvement of event participants to subevent structures, CR predicts the possibility of COS verbs' lexicalizing different aspects of COS subevent structures. If a basic form of COS verb, for instance, lexicalizes only resulting subevent, its causative variants would add the causing subevent to the resulting subevent. If there is an instigating subevent involved, it would also be expressed morphosyntactically. CR also keeps open the possibility that due to asymmetric involvement of event participants in the event, there may be asymmetries in the availability of variants of COS

verbs denoting COS events. Based on the asymmetric involvement of three types of causally responsible properties, and their relation to subevent structures in a COS event, it predicts the divergent behaviour of COS verbs: some verbs may behave only anticausatively, others may behave only causatively and still others may behave alternatingly.

Another significant consequence of CR is that being disposed towards an effect which is a mutual manifestation of causally responsible properties, every CR relation is result-oriented in a particular way. In other words, the interacting properties manifest themselves in a consistent way (manner) of ending up in a new (result) state. The lexicalization of manner and result as component parts of mutual manifestation of interacting properties may vary in their specifications across COS verbs as predicates of COS events. Different COS verbs encode different result states, and this difference in result states is mainly due to the difference in manner in which the interacting casual properties manifest themselves mutually towards a result state. For instance, it is a manner of change in state that differentiates *break* from *shatter*. Both these verbs denote result states, but being two independent lexical entities, both represent two distinctive manners of change in which two distinctive result states emerge. This aspect of CR is discussed in section 5.2.2 in the next chapter.

4.4.3 Causal responsibility and Urdu COS verbs' lexical distinctions.

Having presented the aspects of CR relevant to the issues raised in section 4.4.1 above, let's address those issues by recasting them in CR terms.

Issue 1: *If all COS events obligatorily involve $P^a \times P^r$ relation, why do some of COS verbs predicating those events behave only anticausatively?*

As mentioned earlier, in our 112-COS-verb data set, data from Urdu WordNet and Urdu Lughat confirms that 15 are anticausative-only verbs. But judgement data reduces them to 8

verbs, indicating that native speakers can manipulate the 'use potential' of these COS verbs by morphological operations. This, in turn, indicates the possibility which a CR relation predicts about lexicalization. As stated earlier, by relating the asymmetric involvement of event participants to subevent structures, CR predicts the possibility of COS verbs' lexicalizing different aspects of COS subevent structures. If a basic form of a COS verb, for instance, lexicalizes only a resulting subevent, its causative variant would add the causing subevent to the resulting subevent. An anticausative use profiles the event from the resulting subevent perspective, which is otherwise a mutual manifestation of at least two different properties in a CR relation. In this connection, what seems to be more relevant is not the blocking of agent cause and the licensing of ambient conditions, but the CR relation at the level of conceptual structure where it is originally conceived of. An agent may occur with an anticausative variant whenever it aligns with the event structure and the lexical profile of a verb, whether it is a direct cause or some enabling conditions produced by an agent, that is, a necessary requirement is the CR relation at conceptual level. As mentioned above, the native speakers are prone to extend the application domain of morphological operations, and Urdu verbs like *kʰɪl* 'bloom', for instance, do behave transitively (e.g., *kʰɪl-a*). The CR account predicts that this sort of extension is possible. The shift from 'bloom' to 'cultivate' in *kʰɪl*'s meaning when used transitively indicates the nature of involvement of a cause argument, that is, whether it is directly involved or just assists in producing enabling conditions resulting in an effect. Both types of meaning components are conceptually/semantically compatible and license formal properties of *kʰɪl*, that is, its morphological shape (*kʰɪl-a*) and syntactic behavior (a shift in adicity from one-place to 2-place verb). In this way, CR allows native speakers to utilize lexical resources productively but constrains their use potential through lexical profiles, that is, whether the integration of concepts

under consideration is possible and whether the formal properties of the constituents of a morphologically complex lexical item are also compatible.

As to the occurrence of an agent in a nonsubject position in an anticausative variant, as mentioned in (4.4.1.1) above, the *se*-phrase licenses an agent argument without any causative morphological operation on the base form, yet this anticausative version differs both in syntax and semantics from its direct causative version where the cause argument is in the subject argument position and indicates a volitional participation of the cause entity if it is sentient. The *se*-phrase anticausative, however, denotes an accidental, not volitional, event. Since the *se*-phrase argument can be omitted without a perceptible semantic difference in the BECOME-oriented construal of a COS anticausative variant, this suggests that the *se*-phrase argument in an anticausative context is a supernumerary syntactic argument. However, this occurrence of an agent argument with an anticausative COS variant does suggest that it is neither the lexical specification of the agent argument nor the control of the agent argument over ambient conditions, as proposed by Rappaport-Hovav (2014) for English, that is relevant in Urdu. The CR relation as expressed in Urdu COS verbs appears not to be particularly sensitive to agentivity; rather, it appears to care about a causal property which can include agency, but is not limited to it. The CR account proposed here predicts that the anticausative-only COS verbs are those that describe the COS events wherein both P^a and P^r are conceptualized to be inherent to the same event participant to the extent that either no such a P^a can be externally induced or no externally induced causal power can substitute for it. If the casually responsible P^a is made available, the CR account predicts that the causing subevent in such cases would likely to be realized morphosyntactically provided the formal aspects of such verbs' lexical profiles are not

violated. For instance, if some morphological constraint is violated, the causative variant may be blocked morphologically, as discussed in section 4.1.

Issue 2: *If COS events obligatorily involve $P^a \times P^r$ relation, why do some of COS verbs predicating those events behave only direct-causatively?*

In our 112-COS-verb data set, data from Urdu WordNet and Urdu Lughat confirms that 15 verbs are direct-causative-only verbs. But judgment data reduces them to 8 verbs, indicating that native speakers can manipulate the 'use potential' of these COS verbs by morphological operations. Again, the shift in COS verbs' transitivity status indicates the lexicalization possibilities that the CR account predicts: it allows for all those possibilities that do not violate verbs' event structure and lexical profiles (combinatorics). As given in (4.4.1.2) above, with one likely exception *cəba* 'crush with teeth' as in (13e) above, direct-causative-only verbs do not lexically specify anything about their cause arguments as they allow a range of causes, as shown in (14). Another interesting case is the verb *cur* 'break into pieces', it has no intransitive variant in its simple predicate form, as shown in (17), but in its complex predicate version (Adj-V=ho/kər), it shows alternation, patterning like other similar complex predicates. In its 'Adj-V' use, as in (18) above, it leaves its cause argument unexpressed. The present study argues that the divergent behavior of causative-only COS verbs can be accounted for in terms of the $P^a \times P^r$ relation. This CR relation conceptually licenses both patient and cause arguments. However, in Urdu at least, the cause argument does not seem to be lexically specified in the base forms of these verbs, which are either noun or adjective, not an anticausative verb form, as mentioned in

(4.4.1.2). Had it been lexically specified, *cur* ‘break into pieces’ as a verb would not have had intransitive use in complex predicate form. If the cause argument is not lexically specified, why do the causative-only COS verbs in Urdu not alternate? The shift in the transitivity status of some COS verbs in judgment data from direct-causative-only verbs to 2-variant (C^{ind} & C^{d}) alternating verbs (e.g., *pılpıla* ‘pulp’, *qəlma* ‘make crystal’, *gah* ‘crush crop’, etc.) also signals that they have potential to show the alternation. This is so because they comply with $P^a \times P^r$ CR relation in the denoted COS events and do not violate their lexical profiles. As to the COS verb *cəba* ‘crush with teeth’, which seems to lexically specify the cause argument, it may show the alternation, as in (30) below.

(30) a. lərke cəne cəb gə-e (Direct causative)
boy.M.RPL chickpea.M.3PL crushed (with teeth) go-PRF.M.3PL
‘The boys crushed (with teeth) the chickpeas.’
b. cəne cəb gə-e (Anticausative)
chickpea.M.3PL crushed (with teeth) go-PRF.M.3PL
‘The chickpeas became crushed (with teeth).’

So it may not be the lexical specification of the cause arguments that distinguishes these verbs in Urdu, but the extent of their involvement in the CR relation $P^a \times P^r$ which is so frequent in human observation that they are often construed together with the patient arguments. The CR account predicts that the direct-causative-only COS verbs are those that describe the COS events wherein P^a is typically conceptualized to be external to the event participant bearing P^r to the extent that either no P^a can be internally induced or no internally induced causal power can substitute for it. If an internally induced P^a is/becomes a possibility, the CR account predicts that the resulting subevent in such cases could be realized morphosyntactically, capturing the resulting subevent perspective, as in (31b) below, provided the formal aspects (e.g., morphological constraints as discussed in Section 4.1) of lexical profiles associated with these verbs are not violated.

(31) a. həm=ne pehle amõ=ko **pılpıla-ya** (Direct causative)
we.1PL=ERG first mango.M.3PL=ACC soften.CAUS[d]-PRF.M.3PL
'We first softened the mangoes.'
b. jũhi am **pılpıla-e** həm=ne (Anticausative)
as soon as mango-M.3PL soften-PRF.M.3PL we=1PL=ERG
k[h]a li-ye
eat.NFN take-PRF.M.3PL
'As soon as the mangoes softened, we ate (them).'

Issue 3: If COS events license $P^i \times P^a \times P^r$ *relation, why do some COS verbs predicating those events have anticausative and direct causative variants, but lack an indirect causative variant?*

In such verbs, the base anticausative form of a COS verb is lexically associated with a patient argument only, and the causative alternation arises from the addition of a cause argument introduced via a direct causative morphological operation. Now the question arises why the Urdu verbs, as given in (4.4.1.3) above, cannot have indirect causative variants such as *əkəṛ → əkəṛva*, *bıgəṛ → bıgəṛva*, *xəm → xəmva*, *sʊkəṛ → sʊkəṛva*, *and suk[h] → suk[h]va*, following an indirect causativization process. In certain cases in this category, there seems to be no conceptual blocking that disallows the introduction of an indirect (instigative) cause via an indirect causativization process because it is fully eligible to participate in the events described by the base forms of these verbs. This might be the reason that some of our questionnaire respondents tend to use the indirect causative variants of these verbs. However, this is only possible if the $P^i \times P^a \times P^r$ relation is not violated. If P^r conceptually precludes P^i, then the instigative cause cannot be introduced. In other words, there may be certain patient arguments whose P^rs disallow indirect causation. For instance, consider the examples in (21) repeatd in (32) below.

(32) a. ʊs=ki ak̃[h]ẽ **sʊkṛ-ĩ** (Anticausative)
he.M.3SG=GEN eye.F.3PL shrink-PRF.F.3PL
'His eyes shrank.'
b. ʊs=ne əpni ak̃[h]ẽ **sʊkeṛ-ĩ** (Direct causative)
he.M.3SG=ERG self eye.F.3PL shrink.CAUS[d]-PRF.F.3PL

‘He shrank his eyes.’

c. *ʊs=ne əpni ak̃^{h}ẽ nərs=se (Indirect causative)
he.M.3SG=ERG self eye.F.3PL nurse.F.3SG=INST
sʊkəṛ-va-ĩ
shrink-PRF.F.3PL
‘He had a nurse shrink his eyes.’

(32c) above is not conceptually possible because the act of shrinking eyes defies an indirect causation under most circumstances. This is the reason that glasses/contacts can be involved in shrinking eyes due to their direct involvement in the act of shrinking. In such cases, indirect causation is not possible in the CR relation captured through COS verbs, and indirect causativization is blocked. If a CR relation is not possible, it is reflected in the lexical profile of that verb which disallows such formal combination both morphologically as well as syntactically, as shown in (32c) above.

Issue 4: *If COS events license a $P^{i} \times P^{a} \times P^{r}$ relation, why do some COS verbs predicating those events have direct and indirect causative variants, but lack an anticausative?*

Such COS verbs, as given in (4.4.1.4), show the alternation only in direct and indirect causative variants, and have no anticausative variants which otherwise serve as bases for causative derivation. These verbs, like direct-causative-only verbs, seem to be lexically associated with the cause argument, but specify nothing about it. However, unlike direct-causative-only verbs, these verbs alternate for indirect causative variant. Why? Because P^{r} allows indirect causation. Unlike other verbs in this set, *cit^{h}* ‘crush with teeth’ in (23b) is an agentive verb, and thus resists the elimination of its agent argument, but allows the involvement of any intermediary agent/causee that shows semantic compatibility with the verb. Moreover, this type of alternating COS verbs also pattern like 3-variant alternating COS verbs in not allowing the omission of the subject which is a non-involved causer, but allowing the omission of an intermediary causee, which is otherwise directly involved in the event, as in (33).

(33) a. həm=ne loha **cãḍ-va-ya** (Indirect causative)
we.1PL=ERG iron.M.3SG flatten-CAUS^{ind}-PRF.M.3SG
'We had the workman flatten the iron.'
b. ləṛki=ne əlaıci **cit^{h}-va-i** (Indirect causative)
girl.F.3SG=ERG cardamom.F.3SG flatten (with teeth)-CAUS^{ind}-PRF.F.3SG
'The girl had the mother flatten the cardamom.'
c. ləṛki=ne kəpas **d^{h}ən-va-i** (Indirect causative)
girl.F.3SG=ERG cotton.F.3SG card-CAUS^{ind}-PRF.F.3SG
'The father had us card the cotton.'

The omission of intermediary agent posits a challenge for those accounts that takes an agent argument to be lexically specified and thus not to be eliminated. In a CR account, this possibility can be accounted for in terms of the extent of an argument's involvement in the causation. This account assumes that only the patient argument is lexically specified in all COS verbs, and thus keeps open the possibility of omission of any other relevant argument. However, an argument other than a patient argument is not allowed to be eliminated if and only if its involvement in the CR relation is a necessary condition and in its absence, the CR relation cannot hold itself.

The syntactic omissibility of the intermediary causee in an indirect causative construction, which is otherwise directly involved in triggering the patient argument's causally responsible property for a COS event, also serves as a linguistic window into our conceptualization of causation and indicates that what an Urdu COS verb preferably lexicalizes is the change of state in the patient argument. The Urdu speakers, in the use of the indirect causative variant, can omit the intermediary causee argument, but neither the patient argument nor the cause argument[32] which is indirectly responsible for the event. This might be taken as morphological evidence for the nature of the CR that an Urdu COS verb encodes in its

[32] The cause argument in an indirect causative variant, though indirectly involved in the causation, cannot be removed due a general principle that predicates must have subjects (see Rothstein, 1979 for predicate-linking rule).

semantics[33]. Such lexicalization is likely to override the semantic and the concomitant syntactic contribution of a productive morphological process. The following indirect causative constructions (34–36) illustrate the point:

(34) a. əfsər=ne məzdurõ= se əmarət ɖʰə.-va
officer.M.3SG=ERG labourer.M.3PL=INS building.F.3SG demolish-CAUS^{ind}
di
PRF.F.3SG
'The officer had the labourer demolish the building.'
b. əfsər=ne əmarət ɖʰə.-va di
officer.M.3SG=ERG building. F.3SG demolish-CAUS^{ind} PRF.F.3SG
'The officer had the building demolished.'

(35) a. badʃəh=ne bavərci= se cavəl pək-va-e
king.M.3SG=ERG cook.M.3SG=INS rice. M.3PL cook-CAUS^{ind}-PRF.M.3PL
'The king had the cook cook rice.'
b. badʃəh=ne cavəl pək-va-e
king.M.3SG=ERG rice. M.3PL cook-CAUS^{ind}-PRF.M.3PL
The king had rice cooked.

(36) a. ləṛkiõ=ne rãgsaz= se dʊpətte rãg-va-e
girls.F.3SG=ERG dyer.M.3SG=INS scarves.M.3PL dye-CAUS^{ind}-PRF.M.3PL
'The girls had the dyer dye the scarves.'
b. ləṛkiõ=ne dʊpətte rãg-va-e
girls.F.3SG=ERG scarves.M.3PL dye-CAUS^{ind}-PRF.M.3PL
'The girls had the scarves dyed.'

(34a), (35a) and (36a) are full versions of indirect causative constructions, but (34b), (35b) and (36b) are causee-ellipsis constructions which are equally grammatical in Urdu. The difference between them lies in the argument realization options which can be accounted for in terms of the Urdu COS verbs' CR semantics (lexicalization of the extent of involvement of an entity in an event), a part of which is either directly encoded and externalized via *-va* suffixing, or serves as an access site to conceptual structure, which is its semantic potential, to use Evans' (2009, 2015) terminology, assuming lexical semantic structure and conceptual structure as two distinct but

[33]As pointed out by Ramchand (2019), despite the fact that there are cognitive constraints on human construal of the world and there is no objective way of isolating the cause of a particular dynamic change, human beings' judgments about event entailment relations are often robust and reliable. Morphosyntactic representation in the language carries reliable event entailments concerning the way the speaker represents the force dynamics of the situation.

related cognitive representational levels. Another generalization that (34–36) above support is: the number of syntactic arguments that a verb (for that matter, a morphologically complex predicate) takes on any given occasion is equal to or fewer than the number of its semantic arguments (see Jackendoff, 2002). This generalization obtains for the Urdu COS verbs' causative alternation with only one exception: an Urdu anticausative form allows for the cause (agent) argument in a *se*-phrase, as in (11) above.

To conclude, the CR account proposed here for the description of causative events in Urdu concurs with Rappaport-Hovav's (2014a) position that alternating COS verbs, unlike non-alternating verbs, lexically specify only the patient argument. However, it accounts for the addition/omission of all other arguments in terms of CR relations: $P^a \times P^r$ and $P^i \times P^a \times P^r$. As stated earlier, this analysis has a better chance of informing the semantic theory by explicating the mapping between conceptual causal structure and semantic causal structure as represented in language. As a dispositional theory of causation, it helps to link under disposition (as a property of the causal structure) the ability of an animate agent (volitionality/intentionality) and inanimate causers to be the external arguments, the behavior we see in Urdu COS verbs. Despite an asymmetry in the semantic contributions of arguments, the present study does not entirely sever a cause argument from the COS verb semantics in that it assumes the notion of CR which is either encoded in the COS verb semantics, or the COS verb semantics provides access to the conceptual structure level where the CR relation is originally conceptualized.

4.5 The Interface Nature of the Lexicon

The causativization patterns in the Urdu COS verbs as detailed above have implications for the nature of the lexicon and lexical items. These patterns reveal that the lexicon is not "simply an unordered list of all lexical formatives" (Chomsky, 1965, p.84). Rather, being a long

term-memory association of phonological, syntactic and semantic features, a lexical item licenses an interface between the fragments of these three structures and imposes constraints on the construction of larger syntactic units (Jackendoff, 2002; Culicover & Jackendoff, 2005). The various aspects of the Urdu COS verbs' causativization process discussed above also indicate the interface nature of the lexicon. The Urdu COS verbs' causativization process, as shown in Tables 4.2 and 4.3 above, involves interaction between all three aspects of lexical items: phonology syntax and semantics. At the morphophonological level, the effects of interaction between anticausative COS roots and causative affixes are evident in the phonological structures of the resultant causative variants. To illustrate, the following examples in (37), (38) and (39) show various types of morphological processes and various types of phonological effects that they exercise on the roots:

(37) a. jəl 'burn' → jə.l-a -*a* suffixing (Direct causative)

b. jəl 'burn' → jəl.-va -*va* suffixing (Indirect causative)

(38) a. kʊ.cəl 'crush'→ kʊc.l-a Base modification + -*a* suffixing (Direct causative)

b. kʊ.cəl 'crush' → kʊ.cəl.-va -*va* suffixing (Indirect causative)

(39) a. ḍub 'drown' → ḍə.bo Base modification (Direct causative)

b. ḍub 'drown' → ḍʊb.-va Base modification + -*va* suffixing (Indirect causative)

Apart from morphophonology, the interaction between the syntactic category of the root and the causative morpheme that applies to it (morphosyntax) too is subject to constraints:

(40) a. pək 'cook' → pə.k-a -*a* suffixing (Direct causative)

b. pək 'cook' → pək.-va -*va* suffixing (Indirect causative)

c. * pə.k-a 'cook' → pək-a.-va -a+-*va* suffixing (Indirect causative)

Both *-a* and *-va* suffixes apply to the anticausative base form, while *-va* suffixing with a direct causative stem is not possible, as shown in (40c). Like morphophonological and morphosyntactic constraints, morphological operations too delimit the range of meanings, as detailed in section 4.3 above and Chapter 5. The suffixes *-a* and *-va* involved in the Urdu COS verbs' causativization, thus, can be treated as lexical items that provide an interface between pieces of phonology, syntax, and semantics. It is in this sense that lexical items serve as interface constraints, and the lexicon as a whole is to be regarded as part of the interface components. From this, it follows that "the formal role of lexical items is not that they are "inserted" into syntactic derivations, but rather that they establish the correspondence of certain syntactic constituents with phonological and conceptual structures" (Jackendoff, 2002, p.131).

As shown in Tables 4.2, 4.3 and 4.4, the morphological operations involved in the Urdu COS verbs' causativization reveal that this process is gradient and dynamic with respect to productivity. The most productive rules are those that involve *-a* and *-va* affixes with or without base modification in the anticausative root. Given the facts that the anticausative root must be stored in the lexicon, i.e. in long-term memory because it cannot be constructed online from smaller parts in the absence of productive morphology, and that both direct and indirect causative variants can be constructed online from constituent units (roots and affixes), the question arises of whether the lexicon stores the derivative causative variants along with the anticausative base form. In this regard, the present study, following Jackendoff (2002), argues that lexical items as units are stored in long-term memory, but grammatical words are built online out of constituent lexical items (the anticausative root + *-a* and *-va* affixes in our case) in working memory. What counts is the distinction between productive and semiproductive lexical rules. Productive morphology is regular, except where the meta-constraint of morphological

blocking supplants regular forms, as mentioned in section 4.2 above: a legitimate variant is blocked by phonological or semantic similarity with other available words in the language (e.g., *pɪl → pil* 'crush to extract juice, etc.', but not regular *pɪla*, which may be taken as a direct causative form of *pi* 'drink'). Among all the causative operations, indirect causative morpheme *-va* is found to be the most productive in the present study, except that it is blocked in two cases (ʊ.bəl 'boil' → ʊb.l-a and bəṭ 'divide'→ bə.ṭ-a). So for productive morphology, it seems plausible to assume that words can be composed out of roots and affixes by principles of free combination, in accordance with the phonological, syntactic and semantics restrictions on the individual parts. For instance, the Urdu indirect causative morpheme *-va* can be specified phonologically as a suffix, syntactically as something added to an anticausative (not causative) base to form an indirect causative variant, and semantically as something that operates on a resulting subevent (BECOME-oriented) to form an ACT-oriented indirect causative event with a cause argument which is indirectly involved in the event, and an intermediary causee argument which is directly involved in the event. The outputs of productive lexical rules are likely constructed online in working memory.

The situation is quite different in semiproductive morphological patterns such as base-modification in direct causativization and base modification+*-va* in indirect causativization as discussed in section 4.1. One can confine irregularity to the anticausative base form's syllabic structure (mono- or bi-syllabic), but even then, one cannot predict exactly what the vowel changes to: *mʊṛ* 'bend'→ *moṛ*, and *rʊ̃d* 'crush' → *rɔ̃d*. Thus a semiproductive lexical rule does not apply across the board. Unlike a productive lexical rule, one cannot apply a semiproductive rule to a stem unless one actually knows that the rule applies to it. Moreover, as pointed out by Jackendoff (2002), the inflectional paradigm of a word is always completed even when it lacks a

specified irregular form. For instance, if there is no irregular tense form of a verb, the regular process jumps in as a default since a verb must have a past tense form. Derivational morphology, on the other hand, does not demand a regular pattern that serves as a default, so a semiproductive process can just leave gaps. This behavior of a semiproductive derivational process accounts for the non-alternating behavior of those Urdu COS verbs to which causative operations could potentially apply. However, the present study finds, as shown in Table 4.4 above, that the derivational processes can be potentially dynamic and the language users can synchronically fill the gaps. Such dynamic potential in morphology indicates that until semiproductive rules become productive, they must be listed (at least in part) in long-term memory; they cannot be a product of free combination.

Overall the present study concurs with Jackendoff's (2002) position that semiproductive generalizations are indeed lexical rules/schemas, but speakers must learn one by one the lexical items that the rule relates. By contrast, productive generalizations result from the free combination of individual morphemes that are stored as separate lexical items. Through gradient and dynamic productivity of morphological operations, the study also confirms Jackendoff and Audring's (2020) Relational Hypothesis: "All schemas can be used relationally. A particular subset of them, the productive ones, can also be used generatively" (p.52). As discussed above, some morphological operations seem to be more productive, though not fully productive, and some are less productive or nonproductive. This kind of gradience in morphological productivity suggests that nonproductive schemas are used only relationally to express relations among lexically listed items, but productive (not fully) schemas can be used generatively to create new items not listed in the lexicon as well as relationally to express generalizations among lexically

listed items. This observation leads to a view in which "the grammar is grounded in the relations among lexical items" (Jackendoff & Audring, 2020, p.4).

4.6 Conclusion

This chapter concerns the morphological expression of Urdu COS verbs' lexical relatedness with respect to the causative alternation, that is, the morphological causativization of the anticausative COS verbs and the semantic as well as syntactic features associated with this process. The study shows the value of sharpening data by multi-source evidence and of a holistic approach towards a valency-changing derivation, which examines a phenomenon in the context of the overall grammatical organization of a language, by focusing on how its components (morphology, syntax, semantics, etc.) interrelate. The licensing conditions may cut across all levels of grammatical analyses, and it is pertinent to cross-check all the levels of linguistic description for interface effects on a phenomenon.

The derivational operations confirm that the Urdu COS verbs' anticausative variant is basic and the other two are derived. The study shows that in terms of the frequency of morphological operations involved and semantic coherence evident in the Urdu COS verbs' causative derivation, derivational productivity is gradient, not categorical. Also, the comparison between the data from Urdu WordNet plus Urdu Lughat, and the data from speakers' judgments confirms that native speakers' morphological competence is dynamic and can extend the limits of a rule's domain. The Urdu COS causative derivation shows preference for constructional iconicity, that is, more meaning requires more form or change of form, and suggests parallel increases in complexity in three domains: derived causatives are typically more complex than basic anticausatives in terms of morphological structure, lexical semantic structure and argument structure. However, the morphological processes involved in the indirect causative derivation, by

allowing the intermediate causee to be omissible, provide evidence for two levels of lexical representation – lexical semantic representation and lexical syntactic representation. These are the cases where increases in morphological, argument-structural, and event-structural complexity do not map neatly onto each other. The nature of morphologically signaled relations between the Urdu COS verbs' lexical semantic representations, argument structures and grammatical relations is further elaborated in chapters 5 and 6. As pointed out by Dixon and Aikhenvald (2002), the transitivity and derivational propensities for verbs of different semantic types is a large topic, and should be a focus for future research. This chapter provides sufficient foundation to investigate these aspects of native speakers' morphological competence in the next chapters.

Chapter 5

Event Structure

This chapter is concerned with the combinatory relations between the Urdu COS verbs' semantic roots and event schemas within their lexical semantic representation which provides a foundation for the causative alternation licensing. This chapter is organized as follows. Given the fact that Urdu has morphologically mediated causative alternation, section 5.1 motivates the need for a decompositional semantic framework for elaborating the semantics of morphologically expressed causative alternation variants, that is, the nature of the apparatus we need to find out what lies in the basic variant's semantic root and how it relates to the semantics of other derived variants. Section 5.2 looks into the basic variant's lexical semantic representation and explores grammatically relevant meaning components lexicalized in it. Section 5.3 addresses the lexical semantic representations of the derived variants, that is, how the meanings of constituent components compose to form the meaning of morphologically complex COS verb variants. Section 5.4 concludes the chapter.

5.1 Semantics of Causative Derivation

As is evident in Chapter 4, the Urdu COS causative derivation is not a mere concatenation of morphemes to yield causative variants from an anticausative root, but a systematic form-meaning covariation in that morphological change in the root correlates with semantic change which, in turn, affects syntactic valence. That is, the Urdu COS verbs' morphology carries grammatically relevant meanings which affect sentence structure by augmenting the lexical representation of the verb. Though a word formation process results in new complex signs (signifier plus signified), it has often been undertaken from a formal perspective (see Levin & Rapppaport-Hovav, 2001). But our concern here is how the meaning of

a resulting variant is determined, which, in turn, affects the arity of the variant. The Urdu COS verbs' causative morphology typically packages different concepts in different forms, and comes closer to an agglutinative ideal: causative variants are easily segmented in terms of both form and meaning and each morpheme carries a single chunk of meaning. As noted by Kleiman (1971), Urdu-Hindi has morphological devices that clearly indicate in surface structure the types of predicates that constitute the semantic representation of the item. Thus, most of the Urdu COS verbs' causativization exhibits what Aronoff (1976) calls semantic coherence: form-meaning correspondence. In other words, the meaning of a derivative is compositionally derived from the meaning of the base and that of the affixation or other morphological operations. Such type of causative derivation takes morphemes as Saussurian signs (sound-meaning pairings): the Urdu causative affixation, a dominant pattern in causativization, signals semantic selection and has concomitant syntactic consequences. The causative morphemes *-a* and *-va* as well as other causative operations (e.g., base modification) add new arguments, which are the causers of the action. Though the Urdu COS causative derivation shows semantic transparency, a more fundamental question is what are the meaning components which correspond to formal exponents? This requires an exploration of the causative derivation's semantics: what and how the causative variants mean. Such semantics needs a descriptive framework which could decompose the lexical semantic properties in a limited number of right grain-sized conceptual primitives (Lieber, 2009). This requirement is based on what Szymanek (1988) calls the Cognitive Grounding Condition: "The basic set of lexical derivational categories is rooted in the fundamental concepts of cognition" (p.93).

To meet the requirement of morphologically motivated lexical semantic representation in Urdu, the present study takes Rappaport-Hovav and Levin's (1998a) proposal on event structure

to offer a promising point of departure, assuming that the lexical semantic representation envisioned by them can provide the required analytical apparatus for exploring form-meaning mapping. To recap briefly (see Chapter 2 for detail), this framework proposes a lexicalization constraint: "A root can only be associated with one primitive predicate in an event schema, as either an argument or a modifier" (Rappaport-Hovav & Levin, 2010, p.25). The choice between modifier and argument status depends on the root category: manner root modifies the ACT predicate and the result root functions as an argument of the BECOME predicate. Thus, the lexicalization constraint allows a root to have a single ontological category (either manner or result) and, thus, gives rise to manner/result complementarity. To give an empirical content to the lexicalization constraint, Rappaport-Hovav and Levin refine the notions of manner and result in terms of a scalar structure assumed to be associated with a verb, that is, in terms of the type(s) of change a verb specifies along an associated scale, where "a scale is a set of degrees – points or intervals indicating measurement values – on a particular dimension (e.g., height, temperature, cost), with an associated ordering relation" (p.28). All result roots specify scalar changes, while all manner roots specify non-scalar changes. A scalar change in an entity is any change that can be characterized in terms of an ordered set of degrees along a dimension representing a single attribute, while a nonscalar change in most cases being complex and multidimensional cannot be defined in these terms. These two types of change are in complementary distribution: a root may only lexicalize one type. So manner/result contrast is in fact scalar/non-scalar complementarity. By disallowing roots associated with multiple positions in event schemas, the lexicalization constraint only allows simple canonical realization rules, that is, one-to-one associations of roots and positions in event schemas. However, as Levin and Rappaport-Hovav (2006) point out, some languages contrast with English in enforcing manner/result complementarity with respect to a

verb and its complements. In this context, the question turns to whether the Urdu COS verbs conform to the lexicalization constraint, and its off-shoot manner/result complementarity. The next section 5.2 addresses this question.

5.2 Basic Event Structure

To address the question as to whether the Urdu COS verbs conform to the lexicalization constraint, and its off-shoot manner/result complementarity, we need to identify what is lexicalized – manner, result or both – in the anticausative form of an Urdu COS verb which serves as a base in causative derivation. That the demarcation line has been correctly drawn for semantic distinctions assumes great significance especially for a lexical semantic theory which aims to extract syntactic generalization from lexical behavior (Riemer, 2005). For an explicit characterization of the Urdu COS verbal root's sense individuation, this study, due to cross-linguistic variation, reviews the six diagnostics[34] proposed by Beavers and Koontz-Garboden (2012): denial of result, object deletion, and restricted resultatives for result meaning component, and selectional restrictions, denial of action and complexity of action for manner meaning component, and finds only 'denial of result' as a somewhat relevant test for the Urdu COS data. The reasons for this are as follows: Urdu being a pro-drop language (Mohanan, 1994), object deletion test can produce doubtful results (Hautli-Janisz, 2015). For instance, *əli=ne toṛa/toṛi (kəp/k^{h}ıṛki)* 'Ali broke (cup/window)' is a possible structure in Urdu (the subject *əli* is marked by ergative marker *ne* and the verb predicates the omitted object, not the agentive subject), but its translational equivalent in English is not: '*Ali broke (cup/window)' (see Goldberg, 2001 for licensing object omission)[35]. As to restricted resultatives, Urdu appears to lack this construction;

[34] See Rappaport-Hovav (in Press) for further critique of these tests.
[35] Goldberg (2001) hypothesizes that the intransitive usage of otherwise transitive verbs seems likely to be grammaticalized if the frequent intransitive usage is licensed by the Omission under Low Discourse Prominence principle: "Omission of the patient argument is possible when the patient argument is construed to be deemphasized

instead it has conjunctive participle construction whose one type (manner verb + *kər* + result verb) has diagnostic ability, which constitutes the third test we use in this study. Out of three manner diagnostics, selectional restriction test, as Beavers and Koontz-Garboden themselves note, is limited to transitive verbs, and imposes restrictions on the causer subject, presupposing agentivity in a verb's meaning. Their second manner test – denial of action – is also actor-oriented. Since this study, as mentioned above, takes anticausative variant as a basic form, causer-subject-oriented tests are not directly applicable. In addition, Urdu linguistics at present suffers from a severe paucity of data (unavailability of a sizable corpus) in the COS verb domain, and any attempt for generalization based on a restriction test may not be reliable (see Wright, 2001 for using frequency as an evidence for external/internal causation distinction in the English COS domain). As for their third manner test 'complexity of action', it differentiates between change and manner of change as if they had no affinity of origin, which contrasts with our analysis in which these two meaning components are assumed to be inevitably interlocked in a verb's lexical semantic representation where the semantic source is a causally responsible property of theme argument (manner of change being a part of qualitative state dimension, as Crofts (2012) argues, cannot be nonexistent, and the nature of manner and change (simplex/complex) are interrelated), and where the distinguishing feature is result, not manner (see section 4.4 in Chapter 4 and the test 'directed change' below); also, the aspectual property 'durativity' on which this test is based is not necessarily an inherent property of a verb and thus, is subject to tense-aspect constructions in which it appears. To illustrate, the Urdu COS verb *ṭuṭ* 'break' can have punctual as well as durative readings:

---

in the discourse vis a vis the action. That is, omission is possible when the patient argument is not topical (or focal) in the discourse, and the action is particularly emphasized (via repetition, strong affective stance, discourse topicality, contrastive focus, etc.)". (p.514)

(2) a. ʃax dəs mɪʈ̃ mẽ ʈuʈ gə-i (during ten minutes: durative)
branch.F.3SG ten minutes in break.NFN go-PRF.F.3SG
'The branch broke in ten minutes.'

b. ʃax dəs mɪʈ̃ bəd ʈuʈ gə-i (after ten minutes: punctual)
branch.F.3SG ten minutes after break.NFN go-PRF.F.3SG
'The branch broke after ten minutes.'

c. ʃax dəs mɪʈ̃ tək ʈuʈ gə-i (during ten minutes: durative)
branch.F.3SG ten minutes by break.NFN go-PRF.F.3SG
'The branch broke by ten minutes.'

d. ʃax=ko ʈuʈ-ne mẽ dəs mɪʈ̃ ləg-e (during/after ten minutes: durative)
branch.F.3SG=DAT break-INF in ten minutes take-PRF.M.3PL
'The branch took ten minutes to break.'

e. ʃax əcanək ʈuʈ gə-i ('no during/after reading': punctual)
branch.F.3SG suddenly break.NFN go-PRF.F.3SG
'The branch suddenly broke.'

Of all the six tests proposed by Beavers and Koontz-Garboden, only 'denial of result' is considered relevant to our analysis; it is meant to empirically probe result component in COS verbs which are traditionally considered result verbs. Our second test for root identification, directed change, builds on the notion of "directed change" (Croft, 2012; Levin & Rappaport-Hovav, 1995), and the notion of "causal responsibility", as discussed in Chapter 4. Based on aspectual analysis of COS verbs in terms of temporal phases, it aims at both manner and result components in verb semantics, and helps identify the nature of root in a privative fashion. Our third test, the conjunctive participle construction (CPC) is Urdu-specific, and deals with the interaction of two COS verbs in a same construction, focusing on the inter-clausal semantic behavior of manner and result meaning components; it might generalize to those languages where manner-result conjunctive predicate is available.

5.2.1 Denial of result.

This test being logical in type presupposes the validity of the law of non-contradiction for a semantic representation, which prohibits a proposition and its negation from being simultaneously true (Riemer, 2005). On this test, a verb is a result verb if the semantic

information predicated of the patient argument's result state in a COS event cannot be simultaneously true and false. Since a result verb involves a scalar change, a denial of the value difference in some dimension of a patient argument yields logical contradiction. This contradiction indicates the presence of the result component in that the result state entailed by the core verb meaning and the proposition asserted in the sentence in which the verb appears are truth conditionally related, and thus, can't be defeasible without contradiction. One test is to see if denying the past participle form of the verb applied to a DP coreferential with the putative patient yields a contradiction. The English continuations like *but nothing is different about x* produce such an effect (see Beavers & Koontz-Garboden, 2012 for other options). The examples in (3) show that the Urdu COS verbs generate contradiction in the similar frame (*məgər pʰɪr bʰi yɪh wɛse hi hɛ jɛse tʰA* 'but it is still the same as it was') and thus, have a result component.

(3) a. # kʰɪṛki ṭuṭ gə-i məgər pʰɪr bʰi yɪh wɛse hi
window.F.3SG break.NFN go-PRF. F.3SG but then even it same very
hɛ jɛse tʰi
be.PRST as be.PST.F.3SG
'The window broke, but it is still the same as it was.'

b. # pani ʊbl-a məgər pʰɪr bʰi yɪh wɛse hi
water.M.3SG boil-PRF.M.3SG but then even it same very
hɛ jɛse tʰa
be.PRST as be.PST.M.3SG
'Water boiled but it is still the same as it was.'

c. # dɪya bʊjʰ gə-ya məgər pʰɪr bʰi yɪh wɛse hi
lamp.M.3SG extinguish.NFN go-PRF.M.3SG but then even it same very
hɛ jɛse tʰa
be.PRS as be.PST.M.3SG
'The lamp extinguished, but it is still the same as it was.'

Likewise, all the other Urdu COS verbs in the data set generate contradiction when their result entailment is denied. This shows that a COS verb's base form has result meaning as an essential component of its lexical representation. But does a COS verb lexicalize manner too? This entailment diagnostic interpreted in terms of truth conditions (or their psychological correlates)

for a result state can probe result component only, and fails to determine the logical geography of manner component. Therefore, on the basis of "denial of result" test alone, it would be logically fallacious to conclude that a root cannot have manner if it already has result. That is why, to explore the possibility of "manner + result" root type, the next two sections present such diagnostics as could target both components.

5.2.2 Directed change.

Though the aspectual type of a lexical predicate may be subject to the grammatical context in which it appears (Croft, 2012; Rappaport-Hovav & Levin, 1996, 2010; Rosen, 1996, 1999), and an aspectual coercion can be determined after the VP composition has taken place (Jackendoff, 1997), evidence from lexical aspectual diagnostics suggests that COS verbs typically divide into achievements or accomplishments, and can be characterized in terms of three temporal phases: inception, directed change and completion (Croft, 2012; see Butt, 1995 for Aspect Tier). Achievements are bounded but punctual in that the inception and completion phases are construed as one and the same. Accomplishments are durative and bounded by the inception and completion phases. In the case of accomplishments, directed change involves an incremental change in the patient argument (Dowty, 1991), and can be formalized as either mereological (Krifka, 1989) or scalar (Hay, Kennedy & Levin, 1999; Kennedy & Levin, 2008). The mereological directed change involves an incremental change in the parts of the patient argument, which defines the incremental progress of the event (e.g., *kʊṭər* 'snip'). In this way, the boundedness of the incremental theme determines the boundedness of the event. The scalar directed change exhibits a change in a scalar property of the whole patient, which defines the incremental progress of the event (e.g., *ʊbəl* 'boil'). Kennedy & Levin (2008) argue that it is the type of scale (open/closed) represented by the predicate that determines the boundedness of the

event. Whether the change in patient is analysed as mereological or scalar, it is the directedness of the change that determines the aspectual potential of the predicate; for instance, a predicate is accomplishment if directed, but activity if undirected. The notion of directed change corresponds to what Lieber (2004) refers to as the semantic feature [IEPS] (Inferable Eventual Position or State). Due to our semantic domain "change of state" as defined in Chapter 3, we adapt it to [IES]: there is a sequence of states implied by the action of the verb such that the initial and final states are distinct, and at any point between the initial and final states, some progression has taken place towards the final state. If [+IES] is present, we can make inference about the progression towards the final state. If [−IES] is present, then we cannot make such inference.

An account of directed change is incomplete until an explanation is given for directed change itself, as this study takes it to be. To this end, let us first present some background assumptions connecting directed change and causal responsibility (CR) relation as proposed in Chapter 4.The present account assumes that directed change in a COS event supervenes on an argument's causally receptive property P^r which is its potential to get involved in the event and respond to a causally active property P^a (internal/ external)[36] triggering P^r's potential. The relation between directed change (an aspectual notion) and an argument's CR (a non-aspectual notion) follows from the assumption that the temporal unfolding of an event presupposes the existence of an event participant's property which reflects the temporal progress of the event as a whole (Hay, Kennedy & Levin, 1999; Levin & Rappaport-Hovav, 1999). A patient argument can

[36] The external triggers may include an agent, an instrument, a natural force or a circumstance, and internal triggers may be any physical or chemical change internal to an entity to which its causally responsible property responds. It follows that no COS event is spontaneous; all COS events are 'caused' events in that even what is taken as an internal trigger is external to ('other than' in a narrow sense) the causally responsible property of the entity undergoing the directed change. That is, one property of an entity may causally trigger another property of the same entity for a COS event, as in *High blood pressure weakens brain vessels*. So this study assumes that an external /internal distinction between causal factors is not a sufficient condition to understand the nature of causal relation in a COS event, and its linguistic realization. It is not the causal exogeneity/endogeneity distinction but the causal responsibility which the human conceptualization and grammar are sensitive to.

have multiple P^rs (semantic parameters) (see Mumford & Anjum, 2011 for a dispositional theory of causation), and thus, responses may vary across P^as, giving rise to various causal transactions, as illustrated in (4):

(4) a. məkəi=ke dane **ʊbəl** gə-e (TEMPERATURE)
corn.F.3SG=GEN grain.M.PL boil.NFN go-PRF.M.PL
'The corns boiled.'
b. məkəi =ke dane **pɪs** gə-e (MATERIAL INTEGRITY)
corn.F.3SG=GEN grain.M.PL pulverize.NFN go-PRF.M.PL
'The corns pulverized.'
c. məkəi=ke dane **b^hʊn** gə-e (TEXTURE)
corn.F.3SG =GEN grain.M.PL roast.NFN go-PRF.M.PL
'The corns roasted.'
d. məkəi=ke dane **suk^h** gə-e (WETNESS)
corn.F.3SG=GEN grain.M.PL dry.NFN go-PRF.M.PL
'The corns dried.'
e. * məkəi=ke dane **pɪg^{h}əl** gə-e (LIQUEFIABILITY)
corn.F.3SG=GEN grain.M.PL melt.NFN go-PRF.M.PL
'The corns melted.'

In (4a-d), different P^rs of corns (given in capitalized gloss) are engaged and consequently, different result states are reached and named by different COS verbs. It is, thus, the patient argument's P^r that is nuancing the relation encoded by a COS verb. The semantic compatibility between the lexical profile[37] of a verb and that of its patient argument in a COS event, as manifested in usage patterns in (4 a-d) above, is a prerequisite for lexical encoding of a COS event. That is, the range of patient arguments available to a COS verb and the range of COS verbs available to a patient argument must be correlated in lexicalizing various aspects of an event. This compatibility follows from the fact that P^r is reflected in a COS verb's event structure. This CR reflection in COS verb's semantic structure arises because, being a predicate, a verb's lexical semantic structure is relational (conceptually dependent on conceptually independent lexical concepts (e.g., CORN) (see Evans, 2009; Langacker, 1987, 2008 for

[37] As stated in Chapter 4, we adapt Evans' (2009) definition of lexical profile: the selectional tendencies (semantic as well as formal co-occurrence restrictions) which form part of the linguistic content encoded by a lexical item.

conceptually independent vs. dependent lexical concepts). Among the relata (cause and patient arguments at least at cognitive level) of what Langacker refers to as a profiled relationship named by a verb, the patient argument, as compared to the cause argument, assumes focal prominence in a COS event by virtue of P^r's cognitive as well as linguistic encoding (its lexical profile). One consequence of this profiling is that what counts as a cause or a patient in a COS event may be lexically encoded as part of a COS verb's semantic content. Such a relation between a COS verb and its semantic arguments we refer to as "causal responsibility correspondence" (CRC). Semantic incompatibility arises whenever such a profiled relation does not exist between verb and its semantic arguments, that is, whenever there is a lack of semantic correspondence between predicate and its semantic arguments because the semantic arguments are typed variables and their type specifications are part of the predicate semantics and selectional restrictions on arguments (see Jackendoff, 2002). For instance, (4e) involves semantic anomaly since corns lack property to become liquid in case their temperature is increased to this end and thus, do not belong to the semantic field that accords well with *pɪg^{h}əl* 'melt'. The notion of CRC, then, determines the formal combinatorics of a COS verb and its arguments by virtue of the semantic selectional tendencies they share. For intuitive plausibility, the notion requires correspondence between semantic and formal tendencies of both a verb and its arguments, and, thus, relates distinct aspects of meaning within a lexical semantic representation without resorting to any extra-semantic means except conceptual content to which the semantic content affords access to (see Evans, 2009, 2015).

From the above discussion, it follows that in terms of the CR account, directed change is grounded in P^r. Being grounded in patient-semantics rather than agent/cause-semantics, directed change in a COS event reflects three semantic dimensions of the patient argument which the

dynamics model of causation employs to capture the concept of CAUSE and other related causal concepts such as ENABLE and PREVENT: (a) the tendency of the patient for the endstate, (b) the presence or absence of concordance between the affector and the patient, and (c) progress toward the endstate (Wolff & Song, 2003; Wolff, 2007). In this way, directed change in a COS event ultimately foregrounds two main aspects of the event: first, how change in a patient's state originates and second, how this change unfolds over time. Let us elaborate these two aspects of a COS event in terms of the CR account of a COS event.

At the simplest level, P^a comes in contact with P^r and acts on it. The course which P^a takes to come in contact with P^r and act on it constitutes the MANNER OF ACT(ivity) (a manner of carrying out an action). A change process (a process through which an event participant assumes a state different from its initial state) sets in when the interaction between P^a and P^r starts. The CHANGE PROCESS involves the mutual manifestation of $P^a \times P^r$ and the course which it takes for its logical end characteristic of a COS event constitutes the MANNER OF CHANGE process. RESULT denotes the state the course of a change process eventually ends up in. It is the manner of change process that determines the nature of intermediary states as well as the result state. Thus the coming about of a result state which is the mutual manifestation of $P^a \times P^r$ involves the manner of change process. In sum, the CR analysis of a COS event does not 'zoom out' to a distance that the manner component just appears a single unanalysable whole, but it 'zooms in' on the event so that the manner of ACT and the manner of BECOME (change process) may be seen individually. How a CR relation $P^r \times P^a$, directed change and result state are related can be roughly schematized as follows:

$$\text{Causal Responsibility} \xrightarrow{\text{causes}} \text{Directed Change} \xrightarrow{\text{culminates}} \text{Result State}$$

Figure 4.5 The causality chain

When manner is confined to manner of ACT and defined as a non-scalar change, and result as a scalar change, as in Rappaport-Hovav and Levin (2010), it becomes easier to exclude manner from the semantics of COS verbs and thus term them 'pure' result verbs. A logical consequence of such an observation is manner/result complementarity, that is, manner and result are often in complementary distribution , and a given verb tends to be classified as a manner verb or as a result verb, but not both (Rappaport-Hovav & Levin, 2010). But it becomes more difficult to account for those COS verbs which are said to designate both manner and result (see Beavers & Koontz-Garboden, 2012; Goldberg, 2010). If manner is peculiar to activity predicates (manner verbs), how can some COS verbs which are traditionally called result predicates (result verbs) encode both manner (non-scalar change) and result (scalar change) simultaneously? Instead, a different view of the matter emerges if the notion of manner is extended to the manner of change process without dissociating it from scalar change.The present study assumes that manner as a course, which the process of directed (scalar) change takes in a COS event, is part of the result state the change process culminates in. To put it differently, in a COS event, the CR relation $P^a \times P^r$ implies a transference of a conserved quantity such as energy/force between two event participants, and a change process is just like a terrain involving the intermediary states between the initial state and the final state of the event participant undergoing the change. How this terrain of intermediary states is traversed defines the manner of change which, in turn, defines the nature of result state. Since the manner of change process plays out differently from event to event, so does the result state.

In the light of the above CR analysis of a COS event, the two aspects of a COS event that directed change foregrounds (first, how change in a patient's state originates and second, how this change unfolds over time and culminates) together constitute what we call the manner of

change. The first aspect of the manner of change varies from event to event at event-specific level and for that matter, from verb to verb at verb-specific level (manner transitivity between an event and a dynamic verb which represents it)[38]. That is, it is part of a verb's root content. This is the reason that at verb-specific level, the COS verb *ʊbəl* 'boil' differs from the COS verb *pɪgʰəl* 'melt' and both differ from activity predicates such as *jʰaṛ* 'sweep' and *pũcʰ* 'wipe'. However, at general (class) level, all dynamic verbs share the presence of manner component in their semantics in that all being dynamic verbs encode manner as part of the state in which change occurs. Activity predicates like *jʰaṛ* 'sweep' and *pũcʰ* 'wipe' have manner of ACT as a dominant manner component but COS verbs like *ʊbəl* 'boil' and *pɪgʰəl* 'melt' have manner of change process as a dominant manner component[39]. If the manner of ACT dominates the manner of BECOME due to the predominant involvement of the external stimulus and the lack of a discrete property of the patient in which change occurs, such verbs are ACT-oriented more than they are BECOME-oriented. The change process is directed when a particular, discrete property (at macro level at least) is activated (e.g., temperature in *boiling*), and is undirected when multiple properties are engaged and no property emerges as a discrete property at macro level (e.g., as in *sweeping*). Thus, it is the second aspect of a COS event – how this change unfolds over time – that classifies *ʊbəl* 'boil', and *pɪgʰəl* 'melt' together in one semantic class (directed accomplishment), and *jʰaṛ* 'sweep' and *pũcʰ* 'wipe' in another class (undirected activity). In the former case, the change is directed towards a result state, but in the latter case, the change does not necessarily culminate in a result state.

[38] This sort of analysis is in line with the way a unified biology studies physical organs both for their peculiarities at the organ level and for their commonalities at the cellular level (see Jackendoff, 1997).
[39] Verbs may differ in terms of the level of manner specification: less specified or more specified.The use of manner adverbials or other manner markers just add further specification of manner.

Since in dynamic predicates, the manner component as either a manner of ACT or a manner of BECOME is a part of the state in both directed and undirected changes, the classification criterion for a manner/result contrast must be the result component only. From the denial of result test in the previous section and the CR analysis of a COS event given above, it follows that COS verbs, being directed change verbs, encode both manner and result components in their event structures. Nevertheless, COS verbs at class level are primarily result verbs in that it is the result component that distinguishes them from other verbs which do not necessarily lexicalize result state. In sum, the difference between manner verbs and result verbs must be determined not by how the change in state initiates, but by how this change unfolds over time, that is, the manner component is conflated with state component in both manner (manner-only) and result verbs (manner + result), and the difference between the two verb types lies in whether the change is directed or not.

The relation between how the change in state initiates and how this change unfolds over time are causally related in a COS event. That is, a particular manner in which an entity undergoes a change results in a particular type of endstate. That is why, despite the same class membership, *ʈuʈ* 'break' and *cʊr.mʊr* 'shatter' at verb-specific level differ in their manner and result particulars. However, at class level, the relation of change with its manner is both causal and result-oriented. In an undirected activity (e.g., *jʰaɽ* 'sweep'), in contrast, the relation of change with its manner is causal but not result-oriented. Hence, manner-result contrast in COS verbs can be diagnosed by the presence or absence of a directed change in the patient argument, that is, this semantic property can be treated as a basic parameter in a privative way in distinguishing manner verbs and result verbs. If some manner causes the change in state which is directed toward a result state, the verb which lexicalizes the result construal of an event is a

result verb. However, if the manner causes the change which is undirected (since a set of multiple changes originates), the verb lexicalizes the manner construal of the event and is a manner verb. From this, it follows that a result verb necessarily implies manner meaning component, but a manner verb dos not necessarily implies result component.

Sentences in (5) below illustrate that the anticausative variants, morphosemantically base forms of the Urdu COS verbs, manifest directed change in their event structures:

(5) a. ə̃da **ʊbəl** gə-ya [BECOME [egg <*BOILED*>]]
egg.M.3SG boil.NFN go-PRF.M.3SG
'The egg boiled.'
b. bərf **pɪg^{h}əl** gə-i [BECOME [ice <*MELTED*>]]
ice.F.3SG melt.NFN go-PRF.F.3SG
'The ice melted.'
c. ʃiʃəh **ʈuʈ** gə-ya [BECOME [mirror <*BROKEN*>]]
mirror.M.3SG break.NFN go-PRF.M.3SG
'The mirror broke.'
d. ɣʊbarəh **p^{h}əʈ** gə-ya [BECOME [balloon <*BURST*>]]
balloon .M.3SG burst.NFN go-PRF.M.3SG
'The balloon burst.'

Examples in (5a-d) show that change is directed towards the final state in which the patient argument (the subject in the examples above) ends up. In contrast, the manner-only verbs without a directed change such as *ʈəkra* 'hit', *k^{h}ʊrəc* 'rub', *j^{h}aṛ* 'sweep', etc. encode ACT-oriented (external argument-predicated), not BECOME-oriented (internal argument-predicated), event structures as illustrated in (6):

(6) a. *fərʃ k^{h}ʊrc-a [BECOME [floor <*RUBBED*>]]
floor.M.3SG scrub-PRF.M.3SG
'The floor scrubbed.'
b. əli=ne fərʃ k^{h}ʊrc-a [Ali ACT$_{<RUB>}$ on floor]
ali.M.3SG=ERG floor.M.3SG scrub-PRF.M.3SG
'Ali scrubbed the floor.'

The ACT-orientation in manner-only verbs (where the manner of ACT, not the manner of BECOME is profiled) is the main source of verb semantics, and changes occur along multiple

dimensions, instead of one dimension as is the case with result verbs. The Urdu COS verbs qualify as result verbs by virtue of encoding directed change which entails an endstate, negating of which definitely leads to a logical contradiction since the resulting expression evaluates to false, as (7) illustrates:

(7) # ə̃da ʊbəl gə-ya məgər yıh ʊbl-a hʊɑ
egg.M.3SG boil.NFN go-PRF.M.3SG but it boil-PRF.M.3SG be.PST.M.3SG
to nəhĩ
yet not
'The egg boiled, but is not yet boiled.'

The Urdu COS data analyzed so far in terms of the notions of causal responsibility and directed change shows that an anticausative variant lexicalizes a semantic root which specifies a certain manner of change process resulting in a particular endstate as a mutual manifestation of P^a and P^r. This lexicalization pattern distinguishes COS verbs from other verbs which lexicalize manner but not direction of change. Thus, a COS verb's base form such as *ʈuʈ* 'break' is basically associated with [BECOME$_{<MANNER>}$ [Y <*RES-STATE*>]] event structure. In contrast, a verb of surface contact such as *ʈəkra* 'hit' has a basic association with [X ACT $_{<MANNER>}$].

The lexicalization pattern in semantic roots as analyzed above is not subject to any distinction of external/internal control or causation. Crucially, the notion of CR can also account for this traditional distinction, as discussed in Chapter 4. Smith (1970) divides change verbs into those verbs that describe events where change is controlled by a source external to the entity undergoing the change, and those verbs that describe events where change is controlled not by a source external to the entity, but by the entity itself because change arises from the entity's intrinsic property. Since the entities undergoing the events denoted by verbs like *play* or *speak* are agents, it is possible to describe the "responsibility" of such events in terms of control. However, for the events denoted by verbs like *blush* and *tremble*, the entities undergoing the

eventuality need not be agentive, so the concept of control is inappropriate. For this reason, Levin and Rappaport-Hovav (1995) refer to "causation" instead of "control", and distinguish between externally caused (e.g., *break, shatter, freeze*, etc.), and internally caused events (e.g., *bloom, corrode, rot*, etc.).They define internally caused events where, "some property inherent to the argument of the verb is 'responsible' for bringing about the eventuality" (p.91), and externally caused events as those which "by their very nature imply the existence of an 'external cause' with immediate control over bringing about the eventuality described by the verb: an agent, an instrument, a natural force, or a circumstance" (p.92). Since a causally responsible property of a patient argument P^r can be triggered either internally or externally, a COS verb, as pointed out by Rappaport-Hovav (2014a), can, in principle, describe an event with external cause or without it; it is associated with the same underlying representation, not with two different representations (see section 4.2.2 for derived representations). In this way, only one semantic notion "causal responsibility" obviates the need for external/ internal distinction with respect to verb classification, contra Wright (2001), rendering the distinction superfluous by following Occam's Razor, the principle of parsimony: the account with the fewest constructs is to be preferred in that it explains a greater number of consequences from a smaller number of causes. The notion of causal responsibility, thus, recasts the external/internal distinction in terms of a shared responsibility of causation between a COS event's participants as implied by the verb which describes the event. The difference in verb behavior lies not in whether it predicates externally or internally caused event, but in whether the profiled semantics of the verb is BECOME-oriented or ACT-oriented. Regardless of whether a COS event involves a cause either internal or external to the patient entity, a COS verb which describes the event is basically

BECOME-oriented more than ACT oriented, at least in Urdu. The evidence comes from the following data:

(8) a. kəl do admi bəm d^{h}əmake mẽ **mər-e**
yesterday two man.M.3PL bomb blast in die-PRF.M.3PL
'Yesterday two men got killed in a bomb blast.'
b. kəl dehʃətgərdũ = ne do admi bəm d^{h}əmake mẽ
yesterday terrorist.M.3PL=ERG two man.M.3PL bomb blast in
mar-e
die-PRF.M.3PL
'Yesterday the terrorists killed two men in a bomb blast.'

Unlike the English verbs *kill* and *murder*, their counterparts in Urdu, as shown in (8a, b), can participate in the causative alternation. Since BECOME-oriented verbs represent directed change, they are more likely to be alternating. If BECOME-oriented verbs do not exhibit causative alternation, it is more probably due to a language-specific lexical encoding where ACT-orientation may predominate over BECOME-orientation.

In his critique of Levin and Rappaport-Hovav's (1996) observation that verbs that refer to "internally caused eventualities" are unergative, which is the case if "[…] some property of the entity denoted by the argument of the verb is responsible for the eventuality" (p.501), Engelberg (2019) remarks:

> If we want to apply this idea to the unaccusative German zerbrechen 'break' and the unergative knacken 'creak', which they do not discuss, we have to check whether it is true that some property of the twig is responsible for the creaking in *der Zweig hat geknackt* 'the twig creaked' while there is no property of the twig that is responsible for the breaking in *der Zweig ist zerbrochen* 'the twig broke'. In order to do that, we must know what 'internal causation' is; that is, we have to answer questions like: What is 'causation'? What is 'responsibility'? What is 'eventuality'? Is 'responsibility', contrary to all assumptions of theories of action, a predicate that applies to properties of twigs? What property of twigs are we talking about? Is (internal) 'causation', contrary to all theories of causation, a relation between properties and eventualities? As long as these questions are not answered, proponents of the theory will agree that the creaking of the twig but not the breaking is internally caused while opponents will deny it. And there is no way to resolve this (cf. Engelberg 2001) (pp.173–174).

The CR of event participants and the related notions, particularly effect as a mutual manifesation of P^a and P^r, as defined in Chapter 4 and above, can help deal with such questions without invoking internal/external conceptualizations of causation, at least in the analysis of COS verbs. The notion of CR property here is meant to capture explicitly at least the Urdu speakers' intuitions about anticausative variant's root semantics. The notion can help define precisely the primitive predicates in a lexical decomposition. For example, it can differentiate between ACT-oriented and BECOME-oriented verbs, the distinction which is grammatically relevant for aspectual classification and argument realization, as discussed above. It can also help define which aspects of event structure are independent and which are interdependent. In this way, a COS patient's CR can serve as a source of lexical entailments in terms of which Dowty (1991) defines semantic roles as prototypes. According to Dowty, predicates impose lexical entailments on their arguments by virtue of the prototypical roles the arguments play in the event, and there are only two generalized roles – agent proto-role and patient proto-role. Agent proto-role is associated with volition, sentience, causation, movement and independent existence entailments, while patient proto-role with change, incremental theme, affectedness, stationary and dependence existence. The CR defines these roles as interdependent roles in a causal relation in that the patient argument, though bereft of volitionality and intentionality found with a traditional agent, has a higher degree of involvement in a COS event. Wright (2001) notices this semantic feature of internally caused COS verb, but the present analysis extends this semantics to all COS verbs by virtue of CR relation. Another pertinent question raised by Wright is whether the understood cause which is not present on the surface in an inchoative form is actually part of the template, or whether it is part of the core meaning generally associated with COS verbs. On our analysis, the source of CAUSE relation between two subevents is CR as encoded in verb

semantics. However, the cause that is not specified on the surface in the anticausuative structure but whose presence is understood through real-world knowledge is different from the relational CAUSE and thus, must be associated with a verb's semantic root, not its event schema. This understood cause is either an internal trigger or an external trigger for a patient's CR property, and is implied in a COS verb's relational semantics.

To summarize this section, the CR-based directed change diagnostic shows that all eventive verbs are manner verbs since all encode manner of change independent of manner of activity. The verb classification criterion is result state reached by the patient entity whose CR property gives rise to directed change culminating in the result state. The semantic roots of COS verbs encode both manner and result; however, what differentiates them from manner-only semantic roots is their result component. As to the question of what lies in the base form of the Urdu COS verbs (anticausative variant), on this analysis, the Urdu COS anticausative, whether achievement or accomplishment, lexicalizes both manner and result meaning components, and its event structure is as follows: [BECOME $_{<MANNER>}$ [Y < *STATE*>]]. This event structure differentiates not only between what are traditionally called manner and result verbs, but also between members of the same result class due to 'BECOME $_{<MANNER>}$' which ends up in unique result states, say, in *breaking* and *shattering*. It also enables the anticausatives retain their manner component. Traditionally COS verbs like *breaking* and *shattering* are said to encode different result states, but the present study, in the light of CR account, takes it that they encode different result states due to different 'BECOME $_{<MANNER>}$' .

5.2.3. Conjunctive participle construction (CPC).

Our third test also targets both manner and result meaning components. But first its motivation is in order. The linguistic analyses in general are intra-clausal rather than inter-clausal

despite the fact that clause combination is a central feature of language use, since "human communication is almost always a sequence of connected propositions" (Green, 2017, p.17). Chomsky (2007) argues that clausal recursion is the only unique feature of human communication and therefore the core component of an innate language faculty. Though others (Everett, 2012; Givón, 2002) reject this strong claim, it does demonstrate the importance of clause linking in linguistics (see Dixon, 2009). The point pertinent to our context is that we can employ clause linking to explore the grammatical distinction between manner and result verbs, keeping in mind that certain configurations are possible, but others are not. The present diagnostic, a conjunctive participle construction (CPC) as a test construction, aims at inter-clausal semantic behavior of manner and result verbs.

As noted by Haspelmath (2016), "The precise semantic-pragmatic conditions for combining different kinds of verbs have been much less described than the morphosyntactic properties of the resulting constructions" (p.7). Focusing on verb semantics, this study assumes that the combinatorial possibilities of different verbal roots in semantic composition at inter-clausal level may help differentiate their semantic type because, as observed by Croft (1991), a grammatical construction as a morphosyntactic test defines or requires a specific type of linguistic unit (its domain of application) to satisfy or fill one or more features of the construction. Furthermore, this test also assumes that the nonsubstitutivity of meaning components in a construction indicates that these meaning components are mutually exclusive, which, in turn, indicates that semantic facets of languages are cognitively conditioned (see Stainton, 2014), since verb meanings as cognitive categories are a part of cognitive psychology of the categorization of events and states (Pinker, 1989).

A CPC is a complex sentence which consists of a main clause with a conjunctive participle clause in a subordinate relationship to the main clause (see Kachru, 2006; Subbarao, 2012). The subordinate conjunctive participle clause is called so because it consists of a conjunctive participle, a specific non-finite root form of a verb followed by the conjunctive participle marker *kər* (verb root + invariable *kər*) (Montaut, 2004). The conjunctive participle marker *kər* has the form *ke* when it follows the root form of the verb *kər* 'do' itself. A conjunctive participle clause has multiple functions: temporal, manner, causal, concessive, or antithetical adverb (Kachru, 2006; Montaut, 2004). Relevant to the present study is its manner function (see Kachru, 1971 for adverbialization rule for *V-kər* in Urdu-Hindi). A CPC is sensitive to manner/result distinction as its domain of application, that is, manner and result verbs behave differently with respect to the two component clauses of a CPC. The manner verbs appear in a conjunctive participle clause more freely than the result verbs, as in (9) and (10).

(9) a. əli=ne juta rəgəṛ kər cəmk-a-ya
Ali.M.3SG=ERG. shoe.M.3SG rub.CAUS^{d}.NFN do.CPM shine-CAUS^{d}-PRF.M.3SG
'Ali shone the shoe by rubbing (it).'

b. #əli=ne juta cəmk-a kər rəgəṛ-a
ali.M.3SG=ERG shoe.M.3SG shine.CAUS^{d}.NFN do.CPM rub.CAUS^{d}-PRF.M.3SG
'Ali rubbed the shoe by shining (it).'

As evident in (9), the syntactic positions of manner and result verbs are associated with specific interpretations (see Grimshaw, 1979), and this distinction is preserved in embedding. Thus, for a CPC in its manner function to be well formed, it must satisfy the criterion that the verb in subordinate clause must belong to the semantic type of manner, and the verb in matrix clause must belong to the semantic type of result. Since the semantic relation between manner and result verbs in two constituent clauses of a CPC is always realized in a particular syntactic configuration, such a correlation must be derived from the semantic representations of the verbs involved. The anomalous permutation in (9b) is semantic, not syntactic, in nature, since it can be

removed by replacing open set items (see Cruse, 1986). This semantic oddity arises from the lexical-grammatical incompatibility (see Radden, Köpcke & Siemund, 2007), a violation of co-occurrence restriction on the subordination process in a CPC: when two manner and result verbs are conjoined in a CPC, the manner verb must appear in a conjunctive participle clause, functioning as a manner adverb, and the result verb must appear in the matrix clause, denoting the state resulting from the action performed in a particular manner and time sequence. This constraint follows from manner-result sequential structure: one can do X (manner) to obtain Y (result), but not the other way around. Thus, a CPC helps differentiate between manner and result roots, that is, a CPC licenses a manner verb in its conjunctive participle clause, and a result verb in its main clause, not the other way around. However, it may allow a result verb in its conjunctive participle clause, but in that case, the result verb functions primarily as a manner verb, as in the following examples[40]:

(10) a. əli=ne xərgoʃ ḍəbo kər mar-a
ali.M.3SG=ERG rabbit.M.3SG drown.CAUS^{d}.NFN do.CPM kill.CAUS^{d}-PRF.M.3SG
'Ali killed the rabbit by drowning (it).'

b. dʊʃmən=ne fəsəl jəl-a kər təbah
enemy.M.3SG=ERG crop.F.3SG burn-CAUS^{d}.NFN do.CPM destroy.NFN
ki
do.CAUS^{d}.PRF.F.3SG
'The enemy destroyed the crop by burning'.

In (10), though two lexically result verbs appear in two different clauses, the result verb in the conjunctive participle clause functions as a manner verb, yielding a manner reading, and the result verb in the main clause retains its status, yielding a result reading. The conjunctive participle clause result verb seems to undergo a semantic composition (a sort of conceptual blending) under which its result component gets assimilated into the result verb in main clause due to their mutual semantic compatibility. As Montaut (2004) observes, "the first process does

[40] These examples represent the Urdu COS causative variants, but the analysis holds of anticausative variants as well, as in *xərgoʃ ḍub kər məra* 'The rabbit got killed by drowning.'

not retain its autonomy but rather fuses its meaning with the second process" (p.94).This process enables the conjunctive participle clause result verb to specify the manner of action denoted by the result verb in the main clause. Thus, a manner root does not license its participation in a main clause of a CPC frame, and a result root in a conjunctive participle clause of a CPC unless it behaves like a manner clause. The root type has syntactic ramifications, as it determines the arguments the root combines with, and also the type of clause in a clausal combination in which it appears. Furthermore, the CPC phenomenon in Urdu reveals the semantic relation among verbs which Fellbaum (1998, 2002) terms troponymy (temporal inclusion relation in which one verb specifies a manner in which the other verb's action takes place). In view of the foregoing, this diagnostic also indicates the presence of both manner and result components in a COS verb. This observation is in line with the CR account, as discussed in the previous section, which argues that result verbs, besides result component, encode the manner component. This is suppprted by the behaviour of a result verb in the conjunctive participle clause where it drops out its result component and behaves like a manner verb, satisfying the requirement of a CPC.

In sum, the first diagnostic 'the denial of result' is an entailment test and confirms that result meaning is lexically entailed by a COS verb; the other two diagnostics – directed change and conjunctive participle construction – confirm that the Urdu COS verbs encode both manner and result components of meaning, and due to the directed change they lexicalize, it is the result component that differentiates them from other manner verbs (undirected activities) without a directed change. Thus, the answer to the question raised above as to what lies in the anticausative form of an Urdu COS verb, which serves as a base in causative derivation, is that it lexicalizes both manner and result aspects of a COS event. Due to its semantics as construed above, an anticausative variant only partially conforms to the lexicalization constraint as proposed by

Rappaport-Hovav and Levin (2010): a root can only be associated with one primitive predicate in an event schema, as either an argument or a modifier. On our analysis, in an anticausative variant's event structure, a root can be associated with one primitive predicate in an event schema but both as manner and result. The COS anticausative's semantics thus construed cannot hold of manner/result complementarity; it does not support 'principle of the excluded middle' since it is difficult to show that all roots encode either manner or result but not both.

A pertinent aspect of anticausative semantics is its argument structure. That is, in order for an anticausative version of a COS verb to express the intended message, the patient argument is conceptually, semantically as well as syntactically obligatory, but what is the status of cause argument, given that a COS event is never uncaused? In this regard, COS anticausatives split into BECOME-oriented and ACT-oriented types with respect to the way they presuppose the distribution of causal responsibility between the event participants. Both types of anticausatives presuppose external causation, but it is only BECOME-oriented type that allows for the possibility of internal causation. Thus, BECOME-oriented COS anticausatives presuppose conceptually obligatory but semantically optional cause arguments without external/internal stipulation. To illustrate, consider (11) below:

(11) # a. p^{h}ul suk^{h} gɑ-e bəɣer **kısi** vəjəh ke
flower.M.3PL dry go-PRF.M.3PL without any cause of
'The flowers dried without any cause.'
b. p^{h}ul suk^{h} gɑ-e məgər **kısi=ne**
flower.M.3PL dry go-PRF.M.3PL but someone.M/F.3SG=ERG
ınẽ sʊk^{h}-a-ya nəhĩ
them dry-CAUS^{d}-PRF.3SG not
'The flowers dried but no one (human)/nothing (non-human) dried them.'

The continuation in (11a) *bəɣer kısi vəjəh ke* 'without any cause' is not logically compatible with *p^{h}ul suk^{h} gɑ-e* 'the flowers dried' because no change of state is conceptually possible without a cause. The continuation in (11b) *məgər kısi ne ınẽ sʊk^{h}-a-ya nəhĩ* 'but no one/nothing dried

them' refers to some cause argument and is compatible with *pʰul sukʰ gɑ-e* 'the flowers dried', that is, there appears no semantic anomaly. The interpretation of (11b) negating both external and internal cause arguments simultaneously would render the sentence conceptually implausible, as in (11a). So the cause argument *kɪsi* in the continuation has two possible interpretations: internal-cause interpretation and external-cause interpretation. In the absence of an external agentive[41] cause, (11b) means that some causally active property internal to the patient argument is functioning as a cause argument in a mutual manifestation partnering (see Chapter 3). However, in the absence of an internal agentive cause, (11b) means that some external agentive cause (agent, natural force, circumstance, etc.) is involved. This ambiguity indicates that BECOME-oriented anticausatives presuppose causally active arguments regardless of their exogeneity or endogeneity. In contrast, ACT-oriented COS verbs presuppose the involvement of external, but not internal, cause argument. (12) below illustrates this observation:

(12) #roti pək gɑ-i məgər kɪsi=ne
bread.F.3SG cook go-PRF.F.3SG but someone/something. M/F.3SG=ERG
ɪs-e pək-a-ya nəhĩ
it-ACC cook-CAUS^{d}-PRF.3SG not
'The bread cooked but non one/nothing cooked it.'

The negative continuation in (12) *məgər kɪsi ne ɪs-e pək-ɑ-ya nəhĩ* 'but none/nothing cooked it' refers to some external cause argument the denial of whose involvement in *roti pək gai* 'the bread cooked' is not licensed by an anticausative ACT-oriented COS verb. This type of COS anticausative indicates an external argument's obligatoriness in the event at conceptual level: without such an argument, the event cannot be maintained. However, at linguistic semantic level,

[41] This study, following Cruse (1973), assumes that an object is agentive if it is regarded as using its own energy in carrying out the action. Included amongst these objects are living things, certain types of machine, and natural agents. In addition, this study assumes that if a property of an entity other than the one undergoing a change of state (a causally receptive property) performs a casually active role in bringing out an effect, it is also considered internally agentive for its being the source of energy/force transference. It is in this sense that all cause arguments, external or internal, in a COS event are taken to be agentive in this work.

both BECOME-oriented and ACT-oriented anticausatives lexicalize only resulting subevent without marking any cause argument in their semantic structures; in both cases, cause arguments remain available as conceptual content to which the lexical semantic content of the anticausatives offer access, and support conceptual inferences via pattern completion[42] (see Barsalou, 2005). This intuition is confirmed by the fact that the anticausatives (13a), unlike the passives (13b), are incompatible with adverbs implicating agency.

(13) a. * roti hunərməd̃i se pək gə-i
bread.F.3SG skill with cook go-PRF.F.3SG
'The bread cooked skillfully'

b. roti hunərməd̃i se pək-a-i gə-i[43]
bread.F.3SG skill with cook-CAUS[d]-PRF.F.3SG PASV-PRF.F.3SG
'The bread was cooked skillfully'

The examples in (11–13) above clearly show that both types of anticausatives presuppose cause arguments characterized in terms of mutual manifestation partnering between arguments' causally responsible properties. The distinguishing factor between BECOME-oriented and ACT-oriented anticausatives is the causally active argument internal to the causally receptive argument in a COS event, not the casually active argument external to it[44]. The cause arguments optional in anticausatives, when overtly realized in causatives, are semantically stipulated by the type of a COS verb (BECOME-oriented or ACT-oriented). A BECOME-oriented verb like *sʊk*^{h} 'dry' stipulates the cause argument in its causative version in terms of causal responsibility

[42] The conceptualization is essentially a pattern, namely, a complex configuration of multimodal components that represent the situation. When a component of this pattern matches the situation, the larger pattern became active in memory. The remaining pattern components constitute inferences. When a partially viewed situation activates a situated conceptualization, the conceptualization completes the pattern that the situation suggests (Barsalou, 2005).
[43] Here *gə-i* is an inflected form of the passive-creating light verb *ja* 'go' (see Ramchand, 2008).
[44] In the light of its definition of causal responsibility (see Chapter 3), the present study assumes that in COS domain, all cause arguments, external or internal, are agentive in nature. It is not the external/internal distinction with respect to causation that is valid for classifying anticausative COS verbs into BECOME-oriented and ACT-oriented categories; it is only the internal causation that counts here since the external cause is licensed in both cases. Though internal cause-based distinction between BECOME-oriented and ACT-oriented anticausatives is relevant for specifying the semantic type of implicit cause arguments, the external/internal distinction as defined in Levin and Rappaport-Hovav (1995) cannot be taken as a valid criterion for participating in the causative alternation since both types license external cause arguments and equally participate in this alternation.

correspondence between cause and patient arguments for its becoming dry, not in terms of external/internal causation,. On the other hand, an ACT-oriented verb like *pək* 'cook' stipulates, in addition to causal responsibility correspondence, that the cause argument in its causative version be necessarily external and agentive for its becoming cooked. Such licensing conditions imposed by an anticausative are due to the fact that a verb is an interface rule that licenses not only a correspondence between a piece of phonology, a piece of semantics and a piece of syntax but also specifies the context within which the correspondence is licensed.

5.3 Derived Event Structures

This section elaborates the semantics of direct and indirect causatives in Urdu COS verbs, taking as its starting point the assumption that "Extended verb meanings are built in a monotonic fashion, by a process of template augmentation, whereby existing templates may be augmented up to other possible templates" (Rappaport-Hovav & Levin, 1996, p.5). Through template augmentation, Rappaport-Hovav & Levin (1998a) accounts for variation in syntactic behavior of different English verbs. This notion can be extended to account for the event structures of causative derivatives. (14) below represents an anticausative base and its direct causative derivative in terms of event structure:

(14) a. *pək* 'cook': [BECOME$_{<\text{MANNER}>}$ [Y <*STATE*>]] (Anticausative)

b. *pəka* 'cook': [X ACT] CAUSE [BECOME$_{<\text{MANNER}>}$ [Y <*STATE*>]]] (Direct causative)

The augmented material in (14b) decomposition shows that understanding affixal semantics (the semantics of *-a* here) is essential for understanding the semantics of direct causative derivation. To elaborate affixal semantics and its relation with base semantics, the present study adopts Lieber's (2004) proposal, but not her featural formalism for our present purpose, that the semantic representation of an affix, like that of a lexical base, is composed of semantic skeleton (a function-argument-form-based event schema made up of the same primitive material that

makes up the lexical base skeleton) and semantic body (root), which fleshes out the bones of the skeletons by adding perceptual and cultural aspects of meaning, and the sorts of things that Pustejovsky (1995) includes in his qualia structures: part/whole relationships, information about shape, color, dimension, orientation, origin, function, and so on. This bipartite semantic representation (a propositional structure built from primitive constants and variables) is advocated in Dowty (1979), Levin and Rappaport-Hovav(1995) and Rappaport-Hovav & Levin (1998a).The semantics of derivation involves a single referential unit created out of two distinct skeletons (skeletons of base and affix) such that the affixal skeleton subordinates the base skeleton. The affixal body can place on a skeletal argument the semantic constraints like being sentient and volitional to ensure semantic consistency with its base where the main semantic source is the causally responsible property of the patient argument that is activated in a COS event. This semantic representation of a morphologically complex predicate formation agrees with the proposals (Alsina, 1993; Butt, 1995) in which the predicates are taken to be incomplete and they subcategorize for another predicate. In such proposals, the predicates are taken to be incomplete in the sense that the event structure denoted by a light verb in a syntactically complex predicate formation (or an affix in our case) is incomplete, and must be combined with the event structure of the main/base verb. Light verbs/affixes thus trigger a merger of argument structures giving rise to a single predicational element, with a single, albeit internally complex, event structure. This insight dates back to Frege's (1891, 1892 as cited in Rothstein, 1979) observation that complex expressions could be built up compositionally from simple saturated and unsaturated expressions, by a recursive process of functional application.

The semantic part of derivation involves adding the affixal skeleton as an outer layer to the base skeleton, thereby subordinating the base skeleton. The affix adds a function to its base

skeleton, and the creation of a new derivative always involves the integration of multiple parts into a single referential unit. It is this referential unit that determines how many arguments are eventually projected into the syntax. With respect to event complexity, the function added by an affix overtly represents a subevent (causing subevent) which is otherwise cognitively present but linguistically absent in anticausative form, which can be seen from the semantic anomaly in (15):

(15) #pʰul sʊkʰ gɑ-e bəɣer kısi vəjəh ke
flower.M.3PL dry go-PRF.M.3PL without any cause of
'The flowers dried without any cause.'

After the affixation, this subevent must be syntactically encoded, as illustrated below in (16).

(16) a. pʰul sʊkʰ gə-e
flower.M.3PL dry go-PRF.M.3PL
'The flowers dried.'
[BECOME$_{<MANNER>}$ [flowers <*DRY*>]]
b. gərəm mosəm=ne pʰul sʊkʰ-a di-e
hot weather.M.3SG=ERG flower.M.3PL dry-CAUS^{d} give- PRF.3PL
'Hot weather dried the flowers.'
[hot weather ACT] CAUSE [BECOME$_{<MANNER>}$ [flowers <*DRY*>]]]

In (16b), the transitive variant has an explicit cause *gərəm mosəm* 'hot weather'. The transitive variant involves a causative paraphrase of the basic COS event encoded in anticausative form, not separate uses of a single form. The direct causative derivation in the Urdu COS verbs must meet the semantic constraints as pointed out by Rappaport-Hovav and Levin (1996) for accomplishment derivation in resultative construction. First, the added material must be compatible with the anticausative base form's root semantics. Specifically, it must be construable as part of a prototypical event named by the root. We assume that the semantic type of a cause argument in the causing subevent introduced by a derivational operation is determined by whether the root is BECOME-oriented or ACT-oriented, as stated earlier in section 5.2. In both cases, the cause argument must be the one which can typically activate the patient's causally responsible property. Second, the augmented event structure must be that of a possible lexical

item. In other words, if the resulting lexical event structure is a causative structure, it must be construable as a single unitary core event, i.e. it must be able to be interpreted as direct causation. In addition to these constraints, derived event structures must satisfy template augmentation conditions – Subevent Identification Condition and Argument Realization Condition – on the syntactic realization of event structures (Rappaport-Hovav & Levin, 1998a). The Subevent Identification Condition requires that each subevent in the event structure must be identified by a lexical head (e.g., a V, an A, or a P) in the syntax, and Argument Realization Condition requires that (a) there must be an argument XP in the syntax for each structure participant in the event structure; (b) each argument XP in the syntax must be associated with an identified subevent in the event structure. These conditions are fully satisfied during the derivation of direct causatives from anticausative base forms. Chapter 6 further elaborates the semantic side of these constraints in mapping mechanism.

The patient argument's causal responsibility as reflected through a COS verb's semantic selectional tendencies also concerns the semantics of co-arguments. To elaborate this aspect of causal responsibility, this study, as stated in Chapter 3, draws on Evans's (2009) view of lexical profile as a set of semantic and formal selectional tendencies associated with a lexical concept encoded by a lexical item.

> [A] lexical profile constitutes a body of more or less restricted linguistic knowledge relating to its use potential that is specific to a given lexical concept. It expresses sets of tendencies: patterns of co-occurrence abstracted from usage events. Moreover, as the lexical profile is apparent in language use, it provides a "footprint" that can serve in identifying the specific lexical concept that sanctions a given instance of use. As such, we might think of the lexical profile as providing a distinct "biometric" identifier for each lexical concept. (p.136)

Semantic selectional tendencies have to do with the (range of) lexical concepts with which a lexical concept co-occurs. To illustrate, consider the semantic selectional tendencies associated with the lexical concepts [BOIL], [MELT] and [EXTINGUISH] in (17) below:

(17) a. mã=ne pani ʊbal-a
mother.F.3SG=ERG water.M.3SG boil-CAUS^{d}.PRF.M.3SG
'Mother boiled water.'
b. * mã=ne pani pɪg^{h}l-a-ya
mother.F.3SG=ERG water.M.3SG melt-CAUS^{d}-PRF.M.3SG
'Mother melted water.'
c. * mã=ne surəj bʊj^{h}-a-ya
mother.F.3SG=ERG sun.M.3SG extinguish-CAUS^{d}-PRF.M.3SG
'Mother extinguished the sun.'

The lexical concept [BOIL] (relational concept) selects for semantic arguments (nominal concepts) that can be construed as an actor (mother) and a patient (water). In other words, part of our knowledge about this lexical concept involves knowing kinds of lexical concepts it can co-occur with. (17b) is unacceptable simply because the lexical concept [MELT] is compatible with the actor argument but not with the patient argument. In (17c), the relational lexical concept [EXTINGUISH] verb cannot relate the co-arguments (mother and the sun) because they as nominal concepts lack mutual semantic compatibility: the sun does not have the causally responsible property to be triggered by mother as an external cause. The formal consequences of such lexical semantic tendencies are discussed in Chapter 6 while explicating argument linking.

As pointed out by Kellogg (1955 cited in Kleiman, 1971), a first causal verb (direct causative) expresses immediate causation and a second causal verb (indirect causative) expresses mediate causation of the act or state signified by the primitive (anticausative) form. In case of indirect causatives as in (18b), the indirect causative morpheme *-va* is suffixed to the anticausative (base) form and this derivational operation adds two CAUSE functions introducing two causing subevents: direct and indirect. The CAUSE function introducing direct causing

subevent represents causal responsibility relation between the patient argument (Y) and intermediary causee (direct cause argument X) , and the CAUSE function introducing indirect causing subevent represents causal responsibility relation between the patient argument (Y) and the indirect cause argument (Z).

(18) a. *pək* 'cook': [BECOME $_{<MANNER>}$ [Y <*STATE*>]] (Anticausative)

b. *pəkva* 'cook': [Z ACT] CAUSE [X ACT] CAUSE [BECOME $_{<MANNER>}$ [Y<*STATE*>]]]] (Indirect causative)

The relation between COS verbs' anticausative, direct causative and indirect causative forms with respect to argument semantic roles can be schematized as follows:

(19) a. Anticausative: Patient (subject)
↓

b. Direct causative: direct cause (subject) Patient (object)
↓ ↓

c. Indirect causative: Indirect cause (subject) intermediate causee Patient (object)

However, in clause structure, the indirect causer is obligatory as a subject and direct causer (intermediary causee in an indirect causative clause) is syntactically omissible as illustrated in (20b) and (20c) below. When the direct causer is overtly encoded, it behaves like an instrument argument, though it is in direct causal relation with the COS predicate.

(20) a. dərəxt kəṭ gə-e (Anticausative)
tree.M.3PL cut go-PRF.M.3PL
The trees cut. (Literal)
'The trees were cut.'

b . zəmindar=ne məzdurõ se dərəxt (Indirect causative)
landlord.M.3PL=ERG worker.M.3PL from tree.M.3PL
kəṭ-va di-e
cut-CAUS^{ind} give-PRF.M.3PL
'The landlord had the workers cut the trees.'

c . zəmindar=ne dərəxt kəṭ-va di-e (Indirect causative)
landlord.M.3PL=ERG tree.M.3PL cut-CAUS^{ind} give-PRF.M.3PL
'The landlord had the trees cut.'

The indirect causative variant has significant implications for event schemas inventory and argument realization conditions proposed by Levin (1999) and Rappaport-Hovav and Levin (1998a).The two argument realization options for an indirect causative as in (20b & c) are detailed in the next chapter on argument mapping. Relevant here are its consequences for root-event schema interaction and event schema inventory. The lexical semantic representation of indirect causative in Urdu (see 18b above) embodies two ACT predicates, one associated with indirect cause and one associated with direct (intermediate) cause. This fact about the Urdu COS indirect causatives offers strong evidence that COS verbs associate manner with BECOME (change) predicate to specify result state; otherwise, the association of manner with two ACT predicates requires the manner compatibility between the two functions, which is not possible in the presence of indirect and direct causes as two different entities with different casual responsibility in a COS event. It is unlikely that a semantic root inherited from anticausative base modifies both ACT predicates simultaneously or that a semantic root modifies one ACT predicate and the indirect causative morpheme *-va* modifies the other ACT predicate. The fact that no anticausative base form's lexical semantic representation incorporates cause argument, direct or indirect, without further morphosyntactic aid excludes the first possibility. And the fact that, as mentioned above, the causative morpheme's body is semantically bleached and parasitic on its lexical base excludes the second possibility. It follows that no COS verb has a semantic representation such as [Z ACT <MANNER>] CAUSE [X ACT <*MANNER*>] CAUSE [BECOME <MANNER> [Y<*STATE*>]]]]. The impossibility of manner compatibility between two causes in an indirect causative COS event also implies a condition on the number of root categories a COS verb in its basic form can lexicalize: a COS verb can have two root categories (manner and result), but cannot have more than one manner and more than one result root category.

The Urdu indirect causatives have also implications for event schema inventory. Out of the inventory of event schemas proposed by LRH (1998a, 2010) (see Chapter 2, section 2.2), the following are related to COS verbs:

(21) a. [BECOME [Y <*STATE*>]]

b. [X ACT] CAUSE [BECOME [Y <*STATE*>]]]

Rappaport-Hovav and Levin (1998a) assume that the source of event schema inventory is UG. However, as pointed out by Li (2015), it is possible that not all languages utilize all the schemas in the inventory; so it is important to take the event schema inventory as an empirical question and develop it based on crosslinguistic data. As stated above, the event schema for an Urdu indirect causative is unique in the sense that it incorporates both direct and indirect causes and thus contains semantic primitives more than those in other variants. Therefore, to accommodate the Urdu indirect causatives, Rappaport-Hovav and Levin's event schema inventory needs to include [Z ACT] CAUSE [X ACT] CAUSE [BECOME $_{<\text{MANNER}>}$ [Y<*STATE*>]]]]. In the light of overall discussion concerning morphological and semantic derivations of the Urdu COS verbs, and the nature of relation between semantic root and event schema within a COS event structure, this study proposes the following inventory of event structures for the Urdu COS verbs:

(22) a. [BECOME $_{<MANNER>}$ [Y <*STATE*>]] Anticausative

b. [X ACT] CAUSE [BECOME$_{<MANNER>}$ [Y <*STATE*>]]] Direct causative

c. [Z ACT] CAUSE [X ACT] CAUSE [BECOME $_{<MANNER>}$ [Y<*STATE*>]]]] Indirect causative

5.4 Conclusion

This chapter addresses the present study's third research question: How does a semantic root relate to an event schema in a verb's semantic representation? The data analysis reveals that

the relation between the morphological causative derivation and semantic causative derivation is fairly transparent in the Urdu COS verbal domain. The diagnostics, particularly the directed change test recast in the notion of causal responsibility, show that the semantic root of a COS verb lexicalizes both manner and result meaning components, contra Rappaport-Hovav and Levin (2010); however, it is the result component that distinguishes COS verbs from other verbs that lexicalize only manner component. As to the association between semantic root and event schema, the manner in case of COS verbs predominantly refers to the manner of BECOME, not manner of ACT when a COS event is analyzed in terms of causal responsibility, and this is evident in a COS verb's lexical profile. The data analysis shows that the anticausative COS verbs split into BECOME-oriented and ACT-oriented subclasses with respect to the cause argument's external/internal status as well as its extent of involvement in the causal relation (causal responsibility) which is disposed towards an effect. As to the semantics of causatives, it results from a highly constrained interaction of anticausative semantics and the semantics of causative derivational operations. The indirect causative variant carries significant implications for root-event schema combinatory relation and argument realization conditions proposed by Levin (1999), and Rappaport-Hovav and Levin (1998). The next Chapter 6 explains the nature of relation between Urdu COS verbs' event structures and their syntactic representations with respect to causative alternation.

Chapter 6

Argument Licensing

This chapter addresses the question as to how a root-event-schema-based lexical semantic representation maps onto a syntactic representation for licensing the Urdu COS verbs' causative alternation. More specifically, it involves the relationship between lexical semantic structure, lexical syntactic structure, grammatical relational structure and phrase structure. Concerning the argument realization of the Urdu COS verbs, section 6.1 addresses the questions as to how the Urdu COS verbs' semantic arguments relate to semantic roots and event schema, which semantic arguments are obligatory and which are optional, and how a verb stipulates anything about its arguments' syntactic categories, positions and/or morphological forms. Section 6.2 formulates the linking regularities that are responsible for mapping between the lexical semantic representations of the Urdu COS verbs' causative alternation variants and their syntactic representations. And section 6.3 concludes the chapter.

6.1 Argument Structure in the Urdu COS Verbs

As mentioned in previous chapters, an alternating Urdu COS verb typically shows up in three different syntactic realizations:

(1) pək 'cook'

a. cavəl pək-e Anticausative
rice.M.3PL cook-PRF.M.3PL
'Rice cooked.'

b. mã =ne cavəl pək-a-e Direct causative
mother.F.3SG=ERG rice.M.3PL cook-CAUS^{d}-PRF.M.3PL
'The mother cooked rice.'

c. izza=ne mã =se cavəl pək-va-e Indirect causative
Izza.F.3SG=ERG mother.F.3SG=INST rice.M.3PL cook-CAUS^{ind}-PRF.M.3PL
'Izaa had the mother cook rice.'

Such an alternating phenomenon raises one of the central problems of language: the linkage between lexicon and syntax. In this connection, the present study's focus is on argument linking/licensing which involves the relationship between lexical semantic structure, argument structure, grammatical relational structure and phrase structure. More specifically, the problems to be addressed here are: given a root-event-schema-based lexical semantic representation of a COS verb, (a) how are the semantic arguments of an Urdu COS verb realized as syntactic categories, and (b) how does an Urdu COS verb code for the causative alternation? Sections 6.1.1 and 6.1.2 address (a) and (b) respectively.

6.1.1 Syntactic categorization of semantic arguments.

Given a root-event schema-based lexical semantic representation of a COS verb as discussed in Chapters 4 and 5, understanding the argument realization of the Urdu COS verbs requires addressing at least the following questions: How are the Urdu COS verbs' semantic arguments licensed? By semantic roots or by event schema? Which semantic arguments are obligatory and which are optional? If an argument is semantically obligatory, is it also syntactically obligatory? If so, does the verb stipulate anything about its syntactic category, position and/or morphological form? If so, what and how? Section 6.1.1.1 below argues that both the lexical semantic representation and lexical syntactic representation of an Urdu COS verbs' anticausative variant are monadic, that is, a causative analysis of anticausatives cannot be extended to the Urdu COS verbs, contra Levin and Rappaport-Hovav (1995). Moreover, this section discusses the role of semantic root and event schema in licensing a COS verb's argument valency. Section 6.1.1.2 makes distinction between obligatory and optional arguments of a COS verb in terms of event complexity.

6.1.1.1 Root or event schema arguments?

As stated in section 2.2.2, this study assumes that a verb is associated with two lexical representations: a lexical semantic representation and a lexical syntactic representation (see Levin and Rappaport-Hovav, 1995; Rappaport-Hovav and Levin, 1988). The former encodes the syntactically relevant aspects of verb meaning, whereas the latter, typically called argument structure, encodes the syntactically relevant argument-taking properties of a verb. A lexical semantic representation involves primitive predicates and semantic roots, and a verb's arguments are represented by the open argument positions associated with the primitive predicates. In this way, the semantic relations between verbs and their arguments are defined with respect to the subcomponents in the decomposition. Under the root-event-schema-based event structure account, a verb's semantic arguments are licensed either by its semantic root or by its event schema. The remaining part of this section accounts for this type of licensing.

As detailed in Chapters 4 and 5, the morphological facts of Urdu COS verbs lead the present analysis to conclude that an anticausative variant of an Urdu COS verb is a morphologically basic form, and direct and indirect causative forms are derived via morphological operations. An anticausative COS verb is taken to entail the following event structure: [BECOME $_{<MANNER>}$ [Y <*STATE*>]]. Conceptually, a COS event is a complex event involving at least two event participants: one participant triggering the causally responsible property of the other participant which undergoes the change; the former may be external or internal to the undergoing participant. When a causally active participant is taken as internal, it might be another property of the same undergoing participant as in *High blood pressure burst a blood vessel* where high blood pressure and burst are both properties predicated of blood vessel. Semantically, an anticausative variant lexicalizes only the directed change and the event

participant undergoing it (a BECOME-construal), excluding any external or internal causation, but it never implies that a COS event is uncaused. From this, it follows that an anticausative COS verb's event schema licenses only one semantic argument, i.e. the argument undergoing a change and ending up in a result state, as illustrated in (2).

(2) a. cavəl pək gə-e [BECOME <*MANNER*> [rice <*COOKED*>]]
rice.M.3PL cook.NFN go-PRF.M.3PL
'Rice cooked.'

b. bərf pɪg^{h}əl gə-i [BECOME <*MANNER*> [ice <*MELTED*>]]
ice.F.3SG melt.NFN go-PRF.F.3SG
'The ice melted.'

c. məriz mər gə-ya [BECOME <*MANNER*> [patient <*DEAD*>]]
patient.M.3SG die.NFN go-PRF.M.3SG
'The patient died.'

These anticausatives are prototypical unaccusatives (see Bhatt, 2004; Levin & Rappaport-Hovav, 1995; Richa, 2008 for unaccusativity diagnostics)[45]. Therefore, an anticausative lexical semantic analysis is valid for the alternating COS verbs, at least in Urdu, in that they are basically monadic in terms of their lexical semantic representation, and they take a single direct argument (an NP) in terms of their argument structure. Since an anticausative form is morphologically a base form and does not semantically encode the predicate CAUSE, albeit its conceptual presence, and profiles only the resulting subevent, this study takes both the lexical semantic representation and lexical syntactic representation (argument structure that determines the projection of arguments into the syntax) to be basically monadic.

Levin and Rappaport-Hovav (1995) argue that COS unaccusatives in English and in many other languages as well have a basically causative (dyadic) lexical representation; one of the pieces of evidence they present involves selectional restrictions: "the set of possible subjects

[45]Bhatt's (2004) diagnostics include the following: (i) The past participle of unaccusatives can be used in a reduced relative, unergatives not. (ii) Unaccusatives can never form impersonal passives, while unergatives can. (iii) Only unaccusatives form an inabilitative construction, unergatives (and transitives) require passive morphology to do so.

for the intransitive use of a verb appears to be a subset of the set of possible objects for the transitive use of the same verb" (p.86). They take selectional restrictions as a guide to which variant is basic; to them, the basic use of a verb imposes less stringent restrictions on its arguments. Since the causative form does not impose more stringent restrictions, it is the basic form. This analysis cannot be extended to the Urdu causative alternation COS verbs. First, the present study could not find cases where asymmetry in selectional restriction is found. To illustrate, whereas the intransitive uses of certain COS verbs such as *His promise/The contract/The world record broke, Your mind will open from this book, The skirt lengthened*, etc. are ungrammatical in English, such intransitive uses are grammatical in Urdu. As detailed in Chapter 4, what seems to be relevant in Urdu is not the asymmetry in selectional restrictions on arguments, but the asymmetric involvement of event participants in the event and the semantic compatibility between arguments in terms of causally responsible properties, that is, the potential to trigger the response and the potential to respond to the trigger. For instance, in Urdu, both direct causative version *ʊs ne əpna vədəh/mʊəhdəh toṛ dıya* 'He broke his promise/the contract' and anticausative version *ʊs ka vədəh/mʊəhdəh ṭuṭ gəya* 'His promise/the contract broke' are grammatical sentences even though they are the extended use of the verb *ṭuṭ* 'break'. In contrast, *He broke milk/Milk broke* are grammatical in English, but not in Urdu; instead Urdu lexicalizes this event via *p^{h}ət* 'curdle' indicating that it does not capture the CR relation between the event participants of milk-breaking in the semantics of *break*; rather it encodes this relation in the semantics of *curdle*. So COS verbal domain in Urdu cares about CR correspondence from which the selectional restriction asymmetry between subject and object arguments must follow.

Another evidence in favour of the causative analysis of unaccusative verbs, which Levin and Rappaport-Hovav (1995) draw from Chierchia (1989/2004), involves interpretation of

unaccusatives with adverbial modifiers reflecting the presence of cause argument. The English verbs such as *break* and *open* are compatible with such adverbs as *by itself* in their intransitive use (e.g., *The plate broke by itself*, and *The door opened by itself*). When used with alternating verbs, the phrase *by itself* means 'without outside help', not 'alone'. But when this phrase is used with non-alternating verbs like *laugh* as in *Molly laughed by herself*, the phrase *by itself* means 'alone/unaccompanied', not 'without outside help'. In this causative analysis of unaccusatives, such an adverbial appears to modify a cause, which, given its anaphoric nature, it identifies as the patient argument itself. However, in the present analysis, the Urdu counterparts of *by itself* adverbial *xʊd/xʊd bəxʊd/əpne ap* are taken to indicate the fact that the cause is either internal or not obvious. Whether the cause is internal or not obvious, it is other than a property of the argument itself in which the change takes place. Thus, in the present analysis, both interpretations of *by itself* type adverbials ('without outside help' and 'alone') are not relevant since a COS event as defined in this study can never be uncaused and thus, a change in a property is actually never automatic, but is always due to some cause external/internal to that property of the patient argument. And an Urdu COS anticausative lexicalizes this fact of causal cognition. To illustrate, *The window broke itself* does not necessarily mean that it broke without outside help; rather it may mean that the causing subevent is either internal to the patient argument or not obvious or not profiled in the context of discourse or is not encoded as what Evans (2009) refers to as a pragmatic point of lexical content. The notion of pragmatic point is worth emphasizing here. As defined by Evans, a pragmatic point refers to "schematic aspects of extra-linguistic context encoded in linguistic content by a given lexical concept" (p.124). It relates to communicative function (illocutionary point) and the context of use including setting and participants. From this perspective, a COS anticausative form serves to lexicalize only

resulting subevent (a change in state) whose pragmatic point refers to an unrestricted setting but a restricted event participant: patient argument. The event participant is restricted in the sense that it is supposed to be an entity with a property capable of undergoing a change.

From the above discussion, it follows that the Urdu COS verbs' lexical semantic representation and lexical syntactic representation are basically monadic (unaccusative). The COS event schema of an anticausative variant licenses only one semantic argument, i.e., the argument undergoing the change and ending up in a result state, as illustrated in (2) above. Since a root, as pointed out by Levin (2009), must specify the minimum number of event participants, a COS anticausative root also licenses only one argument (the patient), which is paired with an argument position in event structure. However, as mentioned in section 4.4, an Urdu anticausative form allows for the cause argument in non-subject position, marked by the instrumental case clitic *se*, repeated here as (3) below:

(3) a. gılas lə̣rke= se ṭuṭ gə-ya
Glass.M.3SG boy.M.3SG=INST break.NFN go-PRF.M.3SG
'The glass got broken by the boy[46].'
b. cavəl ʊs=se pək gə-e
rice.M.3PL he.M.3SG=INST cook.NFN go-PRF.M.3PL
'Rice got cooked by him.'

In such cases, as mentioned in Chapter 4, the instrumental *se*-phrase introduces a cause argument, but assumes neither the semantics nor the syntax of a direct causative variant in which the cause argument is in subject argument position and indicates a volitional participation of the cause argument as well as the causing subevent perspective when the cause argument is sentient (see Saksena, 1982). This is the reason that such a use of anticausative variant does not license agentive modifiers as in * *gılas <u>lə̣rke se</u> jan buj^{h} kər ṭuṭ gə-ya* 'The glass got broken by the boy deliberately'. When a *se*-phrase denotes some non-sentient cause argument such as a natural

[46] As mentioned in Chapter1, the passive English gloss given for (3) is not entirely accurate. The Urdu anticausative in fact has no passive interpretation.

force, as in *gılas tez həva se ʈuʈ gə-ya* ‘The glass broke due to the fast wind’, the anticausative *se*-phrase use, like its direct causative version, implies not volitionality but only a change in perspective on the event. The anticausative version indicates a resulting subevent perspective and the direct causative version shows a causing subevent perspective. Also, the *se*-phrase in an anticausative context is different from the *se*-phrase in an indirect causative variant which serves as an intermediary argument, as in *əhməd ne lərke se gılas tərva dıya* ‘Ahmad had the boy break the glass’. In addition to marking the cause argument in an anticausative variant, *se* clitic case can mark instrumental modifiers which combine with anticausative variant, as in *ʃiʃəh pət^{h}ər=* ***se*** *ʈuʈ gəya* ‘The mirror broke from/with stone’, contra Pylkkänen’s (2002) critique of Levin and Rappaport-Hovav ’s (1995) causative analysis of unaccusatives that instrumental modifiers cannot be combined with unnaccusatives.

Since the semantic structure of an anticausative variant represents only a resulting subevent in a COS event, and thus, does not encode CAUSE relation, its event schema is not supposed to license a cause argument. So the additional *se*-phrase argument with an anticausative variant is licensed by its semantic root, not by its event schema, that is, in this particular use of anticausative variant with two arguments, one is structure (event schema) participant and the other is root participant. Apparently its schema resembles direct causative event schema ([X ACT] CAUSE [BECOME $_{<MANNER>}$ [Y <*STATE*>]]]) , but differs from it in terms of CAUSE relation (the nature of CR) between two subevents, which is non-volitional in *se*-phrase anticausative variant, and volitional in direct causative variant when the causally active entity is sentient. This nature of CR cannot be captured by a typical direct causative variant. As to the cause arguments in direct and indirect causative variants, they are introduced by direct causative morpheme *-a* and indirect causative morpheme *-va* respectively, as discussed in Chapters 4 and

5. That is, they are obligatorily event schema participants, not root participants due to their being morphologically complex predicates. This aspect of these variants is discussed in section 5.3.

6.1.1.2. Obligatory vs. optional arguments

All COS verbs designate the same abstract type of event which describes a perceptible change in an event participant's property (state), yet these verbs differ in terms of the change in property being lexicalized in each verb. And the causative alternation variants of a COS verb differ in lexicalizing contextually sensitive construals imposed on a COS causal chain. The anticausative form foregrounds the resulting subevent. The direct causative form foregrounds the direct causation (contactive) between the causing subevent and the resulting subevent, thus licensing the linguistic realization of both subevents. The indirect causative form foregrounds the indirect (distant/noncontactive) causation between the causing subevent and the resulting subevent, thus licensing the third intermediary causing subevent. Furthermore, due to the possibility of external or internal triggering of a CR property, a COS event representation is cognitively a complex event structure consisting of both causing subevent and resulting subevent. However, at linguistic level, three formal variants of an alternating Urdu COS verb represent three event construals (see a CR account of a COS event in 5.2.2). In this context, the question arises as to which arguments are obligatory and which are optional.

The question of obligatory/optional arguments can be addressed in terms of event complexity. As mentioned above and detailed in Chapter 2, complex event schemas license at least two structure participants, one per subevent, realized as subject and object, while simple event schemas license one structure participant, realized as subject; any other arguments are licensed only by root, one of these may be realized as oblique as in the above *se*-phrase anticausative case. As mentioned above, in their anticausative (base form) use, the Urdu COS

verbs do not semantically entail CAUSE relation and encode only resulting event, and thus, has one-participant event schema and one-participant semantic root. Consequently, it has only one obligatory semantic argument which is obligatorily realized syntactically. Any other argument is licensed by the otherwise one-participant root and would be an optional semantic argument. In a direct causative variant, both arguments realize structure participants because this variant has a complex event schema with two structure participants: one (the patient participant) is shared by both event schema and root of the anticausative variant being a basic form, and the second (the cause participant) is introduced by a direct causativization operation such as a direct causative morpheme *-a*. In this way, a direct causative variant is different from an anticausative variant with *se*-phrase since in the former case, the cause argument is introduced as a structure participant by a direct causative morpheme, but in the latter case, it lacks any morphological causativization and is simply licensed by semantic root. From this, it follows that both arguments in a direct causative variant are obligatory arguments, but in the *se*-phrase anticausative variant, the argument realizing the participant shared by event schema and semantic root is obligatory, but the argument in the *se*-phrase is optional as it is introduced by semantic root only.

As to an indirect causative variant, its event structure consists of three structure participants: one (the patient participant) is shared by both event schema and semantic root of the base variant, and the other two (the cause and the causee/intermediary participant) are introduced by an indirect causativization operation. Being structure participants, all of the three arguments in an indirect causative variant should be semantically obligatory; however, as discussed in Chapters 4 and 5, the intermediary argument is omissible, so there is no one-to-one correspondence between semantic arguments and syntactic arguments. In this case, three arguments are semantically obligatory, but two are syntactically obligatory. This distinction in

semantic and syntactic obligatoriness questions The Structure Participant Condition: “There must be an argument XP in the syntax for each structure participant in the event schema” (Rappaport-Hovav & Levin, 1998a, p.113). This condition ensures that the mapping to syntax preserves facets of the event schemas. In many instances, this condition reduces to an alternative condition, The Argument-Per-Subevent Condition: “There must be at least one argument XP in the syntax per subevent in the event structure” (Levin & Rappaport-Hovav, 1999, p.4). The reason for this unusual behavior of an indirect causative variant is more likely to be the nature of indirect causation itself, that is, this variant profiles the causal relation between the indirect causing subevent and the resulting subevent event rather than the direct causing subevent and the resulting subevent. Since the distribution of CR among the COS event participants encoded by an indirect causative variant is different from that encoded by a direct causative variant, the intermediary causing subevent is omissible but its argument is contextually recoverable. The semantic type of this implicit argument (semantically obligatory but syntactically optional) is either definite or indefinite, and stipulated as a contextual restriction on the corresponding variable. For instance, an indirect causative must stipulate that its implicit argument (intermediary causee) is directly responsible for a COS event. Consider the following:

(4) a. həm= ne ɔrət=se cəne b^{h}ʊn-va-e
we.1PL=ERG woman.F.3SG=INST chickpeas roast-CAUS^{ind}-PRF.M.3PL
‘We had (the) woman roast the chickpeas.’
b. əfsər=ne mʊlazım=se ləkṛıyã jəl-va-ĩ
officer.M.3SG=ERG servant.M.3SG=INST woods.F.3PL burn-CAUS^{ind}-PRF.F.3PL
‘The officer had (the) servant burn the woods.’
c. kısan=ne ləkkəṛhare=se dərəxt kət-va-e
farmer.M.3SG=ERG woodcutter.M.3SG=INST tree.M.3PL cut-CAUS^{ind}-PRF.M.3PL
‘The farmer had (the) woodcutter cut the trees.’

(5) a. həm=ne cəne b^{h}ʊn-va-e
we.IPL=ERG chickpeas.M.3PL burn-CAUS^{ind}-PRF.M.3PL
‘We had the chickpeas roasted.’
b. əfsər=ne ləkṛıyã jəl-va-ĩ
officer.M.3SG=ERG woods.F.3PL burn-CAUS^{ind}-PRF.F.3PL

‘The officer had the woods burnt.’

c. kısan=ne dərəxt kət-va-e
farmer.M.3SG=ERG tree.M.3PL cut-CAUS^{ind}-PRF.M.3PL
‘The farmer had the trees cut.’

(4) illustrates indirect causative variants with a complete set of arguments, whereas (5) exemplifies these variants without intermediary causees. In (5), the implicit arguments are indefinite: they can be anyone who has the ability for maintaining COS events denoted by the verbs. In this way, the omissibility of intermediary subevent from the event structure renders the intermediary argument indefinite but the semantics of indirect causative variant inherited from its anticausative base maintains the stipulation that the intermediary argument must be directly causally responsible for the resulting subevent due to $P^a \times P^r$ relation, a discussed in section 4.4. This stipulation is not valid for indirect cause arguments (*həm*, *əfsər* and *kısan*) that assume the subject positions in the sentences above.

The optionality of the intermediary *se*-causee in an indirect causative variant context questions the grammatical status of the causee as argument or adjunct. Ramchand (2007, 2011) argues that the causee is an adjunct in that instrumental marked adjuncts are nearly always possible with all verbal forms. Mohanan (1993) observes that participial adjuncts in Hindi-Urdu require their controllers to be grammatical subjects. Since the *se*-marked causee cannot control into the participial adjunct clauses, it is an adjunct, not an argument. However, the present study supports Richa’s (2008) observation that *se*-marked causee can only be licensed when there is *-va* morphology on the verb. The sensitivity of an intermediary *se*-phrase to indirect causative morphology indicates that this constituent is a part of the argument structure. Richa argues that since arguments can be omitted in Hindi-Urdu, the elision of the intermediary causee is not sufficient to guarantee its adjunct status. Contra Monahan’s observation mentioned above, the *se*-marked causee can easily control into the participial clauses as in *baḍʃəh$_i$=ne jəllad$_j$=se qedi$_k$=ko*

[mɔskərate huɛ]$_{i/j/k}$ mərvaya ‘The king had the executor kill the prisoner while *he$_{i/j/k}$* was smiling. Hence, the indirect causative suffix-*va* on the verb interacts with the *se*-causee and can be left unexpressed only if the causative suffix is overtly present.

6.1.2 Syntactic arguments and the causative alternation.

Having made clear the licensing as well as the obligatory/optional status of the arguments of a COS alternating verb’s three variants, the next question concerns the syntactic realization of these semantic arguments with respect to the causative alternation. As observed by Culicover and Jackendoff (2005), the extent to which the syntactic category of a semantic argument is predictable from the argument’s ontological type primarily depends on the semantic domain of the event to be realized linguistically. The present study is concerned with the domain of concrete COS events, as opposed to abstract events, taken centrally to include the kind of events which entail a specific change in an entity’s perceptible properties such as appearance, dimension, surface integrity, texture, color, odor, temperature, solidity, density, and so on (see section 3.2.1). In a concrete COS event domain, a verb invariably takes semantic arguments of ontological type ‘objects’ which are typically expressed as NPs. As discussed in section 5.2.2, what counts is the semantic compatibility between the lexical profile of a COS verb and those of its arguments in terms of CR relation. This compatibility follows from the fact that the arguments’ CR is reflected in a COS verb’s event structure. This CR reflection in COS verb’s semantic structure arises because, being a predicate, a verb’s lexical semantic structure is relational. What counts as a cause or a patient in a COS event is encoded as part of a COS verb’s semantic content through semantic prime CAUSE and its relation with semantic primes ACT and BECOME. Such a relation between a COS verb and its semantic arguments we refer to as “causal responsibility correspondence’’ (CRC). Semantic incompatibility arises whenever such a

profiled relation does not exist between verb and its semantic arguments. For instance, * *məkəi ke dane pɪg^{h}əl gə-e* 'The corns melted' involves semantic anomaly since corns lack property to become liquid in case their temperature is increased to this end and thus, do not belong to the semantic field that accords well with *pɪg^{h}əl* 'melt'. The notion of CRC, then, determines the formal combinatorics of a COS verb and its arguments by virtue of the semantic selectional tendencies they share. The notion requires correspondence between semantic and formal tendencies of both a verb and its arguments, and, thus, relates distinct aspects of meaning within a lexical semantic representation without resorting to any extra-semantic means except conceptual content to which the semantic content affords access to (see Evans, 2009, 2015).

Although the syntactic category of a COS verbs' semantic argument is fairly predictable on semantic grounds, the verb still can constrain the syntactic realization of its semantic arguments. The *se*-phrase anticausative variant and the omissibility of intermediary causee in an indirect causative variant illustrate mismatch in Urdu between semantic arguments and their syntactic realizations. If a semantic argument denotes a physical object, it is standardly realized as an NP in syntax; however, as seen above, in *se*-phrase anticausative variant, it is realized as an oblique NP argument, rather than as a direct NP argument. In an indirect causative variant, the causee argument, when present, is realized as an instrumental *se*-phrase.

As stated in Chapter 1, Urdu is an SOV language and patterns its constituents in the canonical order 'Subject-Indirect Object-Direct Object-Adjunct(s)-Verb-Auxiliaries'. Since the syntactic functions in Urdu are specified by case endings, they can potentially be rearranged in different word orders for discourse effects. Without any notion of syntactic movement being invoked, the present study follows Culicover and Jackendoff (2005) in assuming that a verb stipulates whether a particular semantic argument is expressed directly or obliquely or in both

ways, but it does not stipulate the order of arguments, which follows from its syntactic realization. Unlike UTAH (Baker, 1988) which assumes that the position of syntactic arguments is uniquely connected with their thematic roles and that the mapping of a thematic role to a particular grammatical function is rigid, the present study assumes that semantic roles cannot be associated uniquely to surface grammatical function, and allows for the possibility that a given semantic argument can be realized in more than one syntactic position (see Levin & Rappaport-Hovav, 2005). Contrary to UTAH, the thematic hierarchical approach proposes the weaker position that thematic roles and syntactic positions are matched by means of a hierarchy, such that the highest-ranked thematic role occupies the highest-ranked syntactic position, namely the subject; and one works one's way down the two hierarchies in parallel until one runs out of arguments. In the hierarchical approach, the account of the causative alternation is as follows: when the lexical semantics includes both agent and patient arguments, the agent outranks the patient and thus occupies subject position; the patient therefore must settle for the next best syntactic slot, the direct object. On the other hand, when the agent argument is absent, the patient is the highest-ranked argument and therefore becomes subject. Under this account, then, the verb only needs to say that the agent is an optional semantic argument, and everything else follows from the linking theory. The present study also departs from the thematic hierarchy approach for reasons presented in 2.1.1, and defines argument positions over structural positions in the verb's lexical semantic representation, that is, in terms of root and event schema participants.

The cases like *se*-phrase anticausative variants as discussed above indicate that the mapping between the lexical semantic structure and phrase structure is not one-to-one. The point of interest is that despite the fact that *se*-phrase is not a semantic argument of an anticausative variant, it is realized as an oblique argument. From this it follows that there is another syntactic

level that manipulates the status of syntactic arguments irrespective of their semantic status and their syntactic position. Many frameworks such as Relational Grammar (Perlmutter & Postal, 1984), LFG (Bresnan, 2001), Role and Reference Grammar (Van Valin & LaPolla, 1997), and Simpler Syntax (Culicover & Jackendoff, 2005) recognize this need in different ways in such cases as passive and raising. This level is called functional structure (f-structure) in Bresnan and GF-tier in Culicover and Jackendoff respctively. The level of grammatical functions permits the grammar to manipulate the assignments of semantic arguments to grammatical functions, and in turn grammatical function assignment determines the syntactic position, case-marking, and agreement. Also, this level allows grammatical functions to map to different phrase structure realizations in different languages: in some languages such as English, they map to fixed positions, while in other languages such as Urdu, they map to case marking, leaving position free. The basic idea is that semantic arguments to be expressed as direct NPs are correlated with positions in the grammatical function tier, which in turn are correlated with syntactic positions in phrase structure. In the light of the above, the Urdu COS causative alternation verbs have the following standard structures:

(6) a. **Anticausative:** *cavəl pəke* ‘Rice cooked.’

ES: [BECOME <MANNER> [cavəl < pəke hue[47]>]]
|
AS: Arg_1
|
GF: Sub
|
PS: NP + NOM V
| |
cavəl pəke

b. **Direct Causative:** *mã̃ ne cavəl pəkae* ‘The mother cooked rice.’

ES: [*mã̃* ACT] CAUSE [BECOME <MANNER> [cavəl < pəke hue>]]]
| |
AS: Arg_1 Arg_2
| |
GF: Sub Obj^d
| |
PS: NP + ERG NP + NOM V
| | |
mã̃=ne cavəl pəkae

[47] *pəke hue* ‘cooked’ is a participial construction which can be used as an adjective (Butt, 1995; Kachru, 2006). The deverbal adjective part of this construction is morphologically derived from the anticausative base form and denotes a result state, not property concept state. The derivation morphological process involved in the formation of deverbal adjectives with ‘huA’ indicates a close relationship between a verb and its patient argument (internal argument in Williams (1981)), and this relationship excludes the cause argument (external argument in Williams (1981)). Hence, the cause argument, whether external or internal, is not central to the core predication of COS verbs, at least in Urdu. Be reminded that the present study assumes under the ‘external’ trigger all those triggers that are traditionally considered ‘internal’ since even the latter triggers are external to the patient’s causally responsible property which undergoes a change of state. Hence, no trigger is ‘internal’ in this sense. However, this study does not assume the argumentation that ‘external’ arguments are not specified lexically.

c. **Indirect Causative:** *izza ne mã̃ se cavəl pəkvae* ‘Izza had the mother cook rice.’

ES:	[iz*za* ACT] CAUSE [*mã̃* ACT] CAUSE [BECOME $_{<MANNER>}$ [*cavəl* < pəke hue>]]]			
	|	|	|	
AS:	Arg_1	Arg_2	Arg_3	
	|	|	|	
GF:	Sub	Obl	Obj^d	
	|	|	|	
PS:	NP + ERG	NP + INST	NP + NOM	V
	|	|	|	|
	Izza=*ne*	*mã̃* =se	cavəl	pəkvae

To summarize, an alternating Urdu COS verb typically shows up in three different syntactic realizations: anticausative (*pək* ‘Y become cooked’), direct causative (*pəka* ‘X cause Y to become cooked’) and indirect causative (*pəkva* ‘X cause Y to cause Z to become cooked’). The anticausative variant is basic in morphology and monadic in both lexical semantic representation and lexical syntactic representation. Other two variants, directive causative and indirect causative, are morphologically derivatives of the anticausative variant. The direct causative variant is dyadic both in lexical semantic representation and lexical syntactic representation. However, the indirect causative is triadic in lexical semantic representation, but it can be dyadic in lexical syntactic representation due to the omissibility of its intermediary argument. In terms of a root-event schema-based lexical semantic representation of a COS verb as discussed in Chapters 4 and 5, an anticausative variant encodes BECOME-construal; consequently, its event schema represents a simple event and licenses only a single argument which undergoes a change and ends up in a result state. However, in *se*-phrase anticausative use, the source of additional argument is semantic root, not event schema. Although the syntactic

category of a COS verbs' semantic argument is fairly predictable on semantic grounds, the verb still can constrain the syntactic realization of its semantic arguments. The *se*-phrase anticausative variant and the omissibility of intermediary causee in an indirect causative variant illustrate mismatch between semantic arguments and their syntactic realizations. If a semantic argument denotes a physical object, it is standardly realized as an NP in syntax; however, in *se*-phrase anticausative variant, it is realized as an oblique NP argument. Such a behavior motivates the syntactic level of grammatical functions which assigns semantic arguments to grammatical functions, and allows grammatical functions to map to different phrase structure realizations in different languages: in some languages such as English, they map to fixed positions, while in other languages such as Urdu, they map to structural cases, leaving position free. Because Urdu is a case rich language, the next section 6.1.2.1 elaborates on the role of case system in the argument realization of the Urdu COS verbs with respect to the causative alternation.

6.1.2.1 Case alternation.

Languages use various means to characterize the interaction between verbal lexical semantics, grammatical relations and word order. Languages may choose to encode this relationship either structurally in terms of designated positions (e.g., English) or via morphological markers (e.g., case in Urdu-Hindi). Case is a system of marking semantic relationship between nouns (arguments) and verbs (predicates), or more generally between dependents and a head (Blake, 2001; Butt, 2005; Fillmore, 1968). Urdu is a case rich language and employs a complex case system for marking semantic relationship between nouns and verbs. This section concerns verbal case marking patterns (cases licensed by verbal predicates such as nominative and accusative), not nominal cases (cases licensed by nominal predicates e.g.,

genitive). Unlike Latin, German and Austrian case markers which are expressed via inflections on nouns, the Urdu case markers are case clitics which are independent entities to the extent that they can be separated from their nominal hosts[48] by other elements such as focus clitics (Butt & King, 2005). This section is concerned with two main questions: (a) How does the case system of the Urdu COS verbs' syntactic arguments characterize the interaction between verbal lexical semantics, grammatical relations and word order with respect to the causative alternation?, and (b) Is it so that an Urdu COS verb's causative morphology can define its syntactic arguments' case morphology in the larger syntactic context in which the syntactic arguments appear?

Within the case-based typology of languages, Urdu is situated as a split-ergative language since the ergative marker is sensitive to perfect morphology and alternates with unmarked nominative case on a transitive subject (Butt & King, 2005; Butt, 2006). In (7) below, the ergative marker *ne* in (7a) alternates with unmarked nominative in (7b) when perfect aspect on verb turns into imperfect aspect.

(7) a. ɪs admi=**ne** cãdi pɪg^{h}l-a-i
this man.M.3SG=ERG silver.F.3SG melt-CAUS^{d}-PRF.F.3SG
'This man melted the silver.'
b. yɪh admi cãdi pɪg^{h}l-a-ta hɛ
this man.M.3SG silver.F.3SG melt-CAUS^{d}-IMPRF.M.3SG is.PRS.3SG
'This man melts the silver.'

In ergative languages, transitive objects and intransitive subjects are treated alike in terms of case marking; in accusative languages, subjects of intransitives and transitives are treated alike and are differentiated from objects in terms of case marking. Being a split-ergative system entails that the ergative would not appear on intransitive subjects. However, as pointed out by Butt and

[48] In Urdu-Hindi, nominals exhibit three stem forms for their case clitics: direct (nominative, e.g., *ləṛka* 'boy'), oblique (e.g., *ləṛke* 'boy') and vocative (e.g., *ləṛke* 'boy'). These distinct nominal forms carry information (e.g., singular vs. plural), even though they are syncretic.

King (2005), this is not supported by the facts of Urdu-Hindi, as Urdu-Hindi intransitives also show an ergative/nominative alternation on subjects, as shown in the minimal pair in (8).

(8) a. ram khãs-a
Ram.M.Sg.Nom cough-Perf.M.Sg
'Ram coughed.'
b. ram=ne khãas-a
Ram.M.Sg=Erg cough-Perf.M.Sg
'Ram coughed (purposefully).'
(Tuite, Agha & Graczyk, 1985, p.264 as cited in Butt & King, 2005, pp.158–159)

As observed by Butt and King themselves, this ergative-nominative alternation with perfect unergatives in Urdu is optional and is correlated with (non)volitionality (see 8b above); In contrast, the unaccusative verbs are not compatible with ergative subjects (Butt, 2006). The present study corroborates this observation since no Urdu COS verb's anticausative form licenses ergative marker on its subjects, as shown in (9) below:

(9) a. cãdi pɪg^{h}l-i
silver.F.3SG melt-PRF.F.3SG
'The silver melted.'
b. * cãdi=ne pɪg^{h}l-i
silver.F.3SG=ERG melt-PRF.F.3SG
'The silver melted.'

Based on Urdu-Hindi data, Butt and King (2005) propose a three-way case marking typology in terms of three distinct uses of case: structural, semantic and quirky. They assume that though these types of case marking are universally available, every language might not make use of each possibility. Urdu-Hindi uses an interaction of all three types of case assignment. Structural case involves case assigned on the basis of syntactic information and is often an instance of default case, as the unmarked nominative case in Urdu-Hindi. Since there are also non-nominative subjects in Urdu-Hindi, the default case nominative is optional and applies when nothing else assigns case to the subject. Semantic case is the most general type of case marking in Urdu-Hindi, and according to Butt and King, its defining characteristics are: (i) predictability

via the formulation of generalizations across predicates and constructions; (ii) a subjection to syntactic restrictions (such as only appearing on certain grammatical functions). The semantic case markers themselves restrict the association between case morphology and grammatical functions. The lexical entry for the ergative *ne*, for instance, would specify that it can only appear on subjects and that when it appears with transitive perfects (structurally required), it entails no conscious control over the action. On the other hand, with intransitive perfects, as in (8b) above, or infinitives, it entails some form of conscious control. Such syntactic and semantic information as part of the lexical entry of the case marker must be consonant with other information, such as the argument structure and the verbal morphology. This treatment of case markers differs from that in mainstream generative tradition in which the case marker is an overt spell-out of features determined independently by the syntax or lexical properties of the verb. Finally, quirky case is lexically stipulated. For example, the subject in the Urdu-Hindi perfect transitive verb *la* 'bring' should be ergative. However, it is nominative, as in (10) below, and this requirement must be stipulated in its lexical entry.

(10) nadya kıtab la-yi
Nadya.F.Sg.Nom book.F.Sg.Nom bring-Perf.F.Sg
'Nadya brought a book.' (Butt & King, 2005, p.187)

Against this background, the question arises as to which case patterns/alternations are compatible with the Urdu COS causative alternation? Let us consider first the canonical case marking associated with the Urdu COS causative alternation variants in (11):

(11) a. məkan ḍʰe gə-ya
house.M.3SG.NOM collapse.NFN go-PRF.M.3SG
'The house collapsed.'
b. malık=ne məkan ḍʰ-a di-ya
owner.M.3SG=ERG house.M.3SG.NOM collapse-CAUS[d] give-PRF.M.3SG
'The owner demolished the house.'

c. malık=ne məzdur=se məkan ɖʰə-va
owner.M.3SG=ERG labourer.M.3SG=INST house.M.3SG.NOM collapse-CAUS^{ind}
di-ya
give-PRF.M.3SG
'The owner had the laborer demolish the house.'

As mentioned above and evident in (11a), the Urdu anticausatives are compatible with default phonologically null nominative case. Even when it is used with a cause argument having non-volitional interpretation as discussed in section 6.2.1.1, there is no change in its subject argument's case status, though the cause argument is marked with instrumental *se* case instead of the ergative or the nominative typical of a cause argument. However, this study has found only one syntactic context, verbal infinitival morphology, to which a COS anticausative shows sensitivity and optionally takes accusative case clitic *ko* in subject position, and may have habitual, or desiderative interpretation, as shown in (12), (13) and (14) below:

(12) a. pani ek so dərjə-e-hərarət pər ʊbəl-na hɛ
water.M.3PSG.NOM one hundred temperature on boil-INF be-PRS.M.3SG
'Water is to boil at 100^{o} temperature.' (NATURAL PROPERTY)
b. pani=ko ek so dərjə-e-hərarət pər ʊbəl-na hɛ
water.M.3PSG=ACC one hundred temperature on boil-INF be-PRS.M.3SG
'Water is to boil at 100^{o} temperature.' (NATURAL PROPERTY)

(13) a. ınsan jəld ya bə-der mər-na hɛ
man.M.3PSG.NOM soon or with-late die-INF be-PRS.M.3SG
'Man is to die sooner or later.' (NATURAL PROPERTY)
b. ınsan=ko jəld ya bə-der mər-na hɛ
man.M.3PSG=ACC soon or with-late die-INF be-PRS.M.3SG
'Man is to die sooner or later.' (NATURAL PROPERTY)

(14) a. am ıs məsale=se pək-na cahiye
mango.M.3PSG.NOM this powder.M.3SG=INST ripe-INF should
'Mango should ripe with this powder.' (DESIDERATIVE)
b. am=ko ıs məsale=se pək-na cahiye
mango.M.3PSG=ACC this powder.M.3SG=INST ripe-INF should
'Mango should ripe with this powder.' (DESIDERATIVE)

In contrast to anticausative variant, the case marking on subject arguments in both direct and indirect causative variants (see (11b & c) above) are very much sensitive to aspectual

morphology on the verb. In a perfect transitive context, the canonical case pattern in the direct causative variant is ergative-nominative; however, in an imperfect transitive context, the pattern is nominative-nominative, as in (15):

(15) malık məkan ḍʰ-a de-ta
owner.M.3SG=NOM house.M.3SG.NOM collapse-CAUS^{d} give-IMPRF.M.3SG
hɛ
be-PRS.3SG
'The owner demolishes the house.'

This change in case pattern across COS verb class indicates the sensitivity of case marking to verbal aspectual morphology, but carries no semantic entailment. The possibility of semantic entailment arises when case alternation (nominative-accusative) appears on the object arguments in the same perfect transitive context, as noted by Butt (1995, 2006) and Butt and King (2005). Consider the following:

(16) a. malık=ne məkan ḍʰ-a di-ya
owner.M.3SG=ERG house.M.3SG.NOM collapse-CAUS^{d} give-PRF.M.3SG
'The owner demolished a/the house.'
b. malık=ne məkan=ko ḍʰ-a di-ya
owner.M.3SG=ERG house.M.3SG.ACC collapse-CAUS^{d} give-PRF.M.3SG
'The owner demolished a particular/the house.'
c. malık=ko məkan ḍʰ-a-na hɛ
owner.M.3SG=DAT house.M.3SG.NOM collapse-CAUS^{d}-INF be.PRS.3SG
'The owner has to demolish a/the house.'

As argued by Butt (1993b), a bare NP object such as *məkan* in (16a) can be interpreted either as a definite, a generic, or even an indefinite, depending on the context. However, the *ko*-marked object, as in (16b), must be interpreted either as a specific indefinite (a particular house), or as a definite (the house). So this case variation entails the semantic effect of (non)specificity. The semantic contribution of case marking is also obvious in the context of infinitival construction, as in (16c) above, which gives rise to an ergative-dative alternation on subject argument; this alternation entails obligation on the part of subject argument.

The case patterns and alternations so far discussed indicate that case marking in Urdu has both syntactic and semantic reflexes whose diversity reflects distinctions across verb classes and constructions. The Urdu COS anticausative variant interacts with case marking and its overall patientive semantics does not allow for ergative marking on the cause argument; instead it is compatible only with instrumental case on the cause argument, which implies non-active role of the argument in the COS event. The case alternation in the direct causative variant, either on subject or object arguments, also signals semantic differences (specificity/obligation) in the overall interpretation of the clause. Since the direct causative variant introduces ACT-orientation to the semantics it inherits from its base anticausative, it typically allows for ergative case *ne* on the cause argument in the perfect transitive context or unmarked nominative in the imperfect transitive context. Although it allows ergative-dative alternation on subjects and nominative-accusative alternation on objects, these case markers do not change the causal status of the arguments in the COS event. In other words, semantic contribution of obligation/ specificity does not affect their CR relation; it does not make the difference whether some casual event is volitional or not, and some event participant is definite or not; what counts in the interaction between lexical syntactic structure, grammatical relations and case marking is the way casual cognition is lexicalized in a language. From this it follows that the causal morphology of the direct causative variant also interacts actively in the case assignment to their syntactic arguments.

The interaction between the causal morphology of COS verbs and their case assignment is more obvious in the Urdu indirect causative variants. Consider (11c) repeated here as (17a):

(17) a. malık=ne məzdur=se məkan ḍʰə-va
owner.M.3SG=ERG labourer.M.3SG=INST house.M.3SG.NOM collapse-CAUS^{ind}
di-ya
give-PRF.M.3SG
'The owner had the labourer demolish the house.'

b. malık məzdur=se məkan
owner.M.3SG=NOM labourer.M.3SG=INST house.M.3SG.NOM
ḍʰə-va-ta hɛ
collapse-CAUS^{ind}-IMPRF be-PRS.3SG
'The owner has the labourer demolish a/the house.'

c. malık=ne məzdur=se məkan=ko ḍʰə-va
owner.M.3SG=ERG labourer.M.3SG=INST house.M.3SG.ACCU collapse-CAUS^{ind}
di-ya
give-PRF.M.3SG
'The owner had the labourer demolish the house.'

d. malık=ko məzdur=se məkan=ko
owner.M.3SG=DAT labourer.M.3SG=INST house.M.3SG.ACC
ḍʰə-va-na hɛ
collapse-CAUS^{ind} -INF be-PRS.3SG
'The owner has to have the labourer demolish the house.'

As shown in (17a & b), the canonical case pattern in an Urdu COS indirect causative variant is ergative-instrumental-nominative in a perfect context, and nominative-instrumental-nominative in an imperfect context. Such tense/aspect-based case variations do not have interpretive consequence beyond the tense/aspect difference. As detailed in Chapter 4, the indirect causative morpheme *-va* introduces two arguments (a cause and a causee) to the semantics of its base anticausative. The cause argument is marked either with ergative or nominative case, the causee argument has instrumental case *se* and the patient argument is marked either with null nominative or accusative case. The case alternations on subjects or objects in a perfect context, as shown in (17a, c & d) above, are just like those in the direct causative variant, that is, they may indicate semantic distinction in the causal interpretation in terms of specificity/obligation, but do not alter their CR relation. The point of interest is that the distribution of case markers on all the arguments in an indirect causative variant is determined by the distribution of CR between the event participants of a COS event. The case assignment that remains constant is the intermediary causee's instrumental case *se*. This is the same marker that is associated with the cause argument in an Urdu COS anticausative variant discussed in section 6.2.1.1 above. The *ko*

clitic with accusative reading is available neither for cause argument in an anticausative variant (18b) nor for intermediary causee in an indirect causative (19b):

(18) a. dərzi=se kəpṛa kət gə-ya
tailor.M.3SG=INST cloth.M.3SG cut.NFN go-PRF.M.3SG
'The cloth got cut by the tailor.'
b. *dərzi=ko kəpṛa kət gə-ya
tailor.M.3SG=ACC cloth.M.3SG cut.NFN go-PRF.M.3SG
'The cloth got cut by the tailor.'

(19) a. həm=ne dərzi=se kəpṛa kət-va li-ya
we.1PL=ERG tailor.M.3SG=INST cloth.M.3SG cut-CAUS^{ind} take-PRF.M.3SG
'We had the tailor cut the cloth.'
b. *həm=ne dərzi=ko kəpṛa kət-va li-ya
we.1PL=ERG tailor.M.3SG=ACC cloth.M.3SG cut-CAUS^{ind} take-PRF.M.3SG
'We had the tailor cut the cloth.'

The non-availability of accusative case *ko* for the intermediary causee supports Saksena's (1982b) observation that the affectedness of the causee is relevant for case assignment: when not affected by the action, the causee is realized as an oblique argument with the instrumental *se*; when affected, the possibility of *se-ko* alternation may arise, as in (20):

(20) a. sadaf=ne masaalaa cak^{h}-aa
sadaf.F=Erg spice.M=Nom taste-Perf.M.Sg
'Sadaf tasted the seasoning.'
b. anjum=ne sadaf=ko masaalaa cak^{h}-va-ya
anjum.F=Erg sadaf.F=Acc spice.M=Nom taste-Caus-Perf.M.Sg
'anjum had Sadaf taste the seasoning.'
c. anjum=ne sadaf=se masaalaa cak^{h}-va-ya
anjum.F=Erg sadaf.F=INST spice.M=Nom taste-Caus-Perf.M.Sg
'Anjum had Sadaf taste the seasoning.' (Butt, 1998, p.11, (24))

In (20b), *ko* clitic on Sadaf indicates the focus is on Sadaf who is affected, not on seasoning, whereas in (20c), the focus is on seasoning; whether it is tasted by Sadaf or someone else does not matter. The present study finds that the notion of affectedness also applies to the instrumental *se*-marking on the cause argument in an anticausative variant in which action is non-volitional and the argument is not affected. In COS domain, neither the intermediary causee nor the non-

volitional cause argument denote BECOME-orientation, that is, they are not affected in the aspectual sense of Krifka (1992) where affectedness is captured by constructing a mapping between an event denoted by a verb and its object in such a way that every subpart of the event can be seen as corresponding to a subpart of the object. Since neither the intermediary causer in an indirect causative variant nor non-volitional cause argument in an anticausative variant map onto the event structure of COS predicate, that is, they are not implicated at each stage of the caused event, they are not compatible with *ko* accusative case, and thus not subject to any case alternation in their respective syntactic environment.

As evident in the above discussion, the case marking alternations with respect to the Urdu COS causative alternants and the concomitant semantic effects (specificity and affectedness alternations as pointed out by (Butt & King, 2005) render as too simplistic the typological division of ergative vs. accusative languages, and the mainstream generative division of structural and inherent case. This division in a strict form cannot be upheld in Urdu. Though there is not one-to-one correspondence between grammatical relations and case makers, there is often a systematic correspondence meaning and case marking (Mohanan, 1994). Having established the interaction between lexical semantics, argument structure, grammatical relations and case system with respect to the Urdu COS verbs' causative alternation, let us now formulate linking regularities found in our COS data.

6.2 The Linking Algorithm

This section focuses on the formulation of the rugularities that are responsible for mapping between the lexical semantic representations of the Urdu COS verbs' causative alternation variants and their syntactic representations. The examination of various aspects of the Urdu COS verbs with respect to the causative alternation in previous chapters and in the above

sections in this chapter leads us to two main general assumptions: Event Structure Geometry Principle and Causal Responsibility Principle.

6.2.1 Event Structure Geometry Principle.

Linking reflects event structure geometry.

For a prototypical mapping between an event structure and a syntactic representation, this principle means that linking patterns reflect not some arbitrarily stipulated hierarchy, but the hierarchy encoded in event structure. In other words, the hierarchical relationships between arguments in an event structure are mirrored in the hierarchical relationships between constituents at syntactic levels. This is the reason that arguments bearing relations to predicates show structural differences in the lexical semantic representations (event structures). Consider, say, the argument in the two-place direct causative variant of the Urdu COS verb which encodes complex event structure with two subevents: causing subevent and resulting subevent. Event Structure Geometry Principle dictates that the semantic argument of ACT predicate (an event schema participant) in the causing subevent is linked to a syntactic subject position, and the semantic argument of BECOME predicate (another event schema participant) in the resulting subevent is linked to a syntactic object position, and not the other way around (where the syntactic realizations of ACT argument and BECOME argument are reversed) because in the latter case, the structural relations in the Urdu direct causative variant's event structure are not preserved at syntactic level. That is why we do not find any verb whose event structure's argument positons are swapped but whose meaning does not change. So the relative level of the event structure arguments that do link must be reflected in argument structure as well as grammatical functional structure. As to the phrase structure level, the phrase order may vary cross-linguistically and is governed by language-specific word order system.

6.2.2 Causal Responsibility Principle.

The distribution of causal responsibility among event participants is pertinent to determining basic adicity of verbs describing those events.

This principle assumes that the distribution of causal relations among event participants is fundamental to human conceptualization of events, and thus allows the identification of arguments in terms of their causal status across all the three variants of the Urdu COS causative alternation verbs. In an anticausative construal of a COS event, the event participant profiled is that entity whose causally responsible property 'P^r' undergoes a perceptible change; so this variant has a monadic event structure. As discussed in section 4.4, in a direct causative construal of a COS event, the direct causation relation '$P^a \times P^r$' among the COS event participants is profiled; this is the reason that the participant whose property (P^r) undergoes a change and the participant whose property (P^a) triggers the change are both causally responsible. So a direct causative variant has a dyadic event structure. In an indirect causative construal, the indirect causation relation '$P^i \times P^a \times P^r$' among the COS event participants is profiled: the participant whose property undergoes a change, the participant whose property triggers the change, and the participant whose property makes the intermediary participant bring about the change are all causally responsible in different ways. So a typical indirect causative variant has a triadic event structure at both semantic and conceptual levels.

When couched in terms of the principles of Event Structure Geometry and Causal Responsibility, the analysis of the Urdu COS verbs' behavior with respect to the causative alternation, as presented above, leads us to the following argument linking regularities:

6.2.3 The Directed Change Linking Rule.[49]

The COS event participant whose causally responsible property undergoes a directed change corresponds to either a direct or an oblique argument.[50] When direct argument, it is realized as a nominative subject in an anticausative variant, but as a nominative direct object in a causative variant. When oblique argument, it is realized as an accusative direct object in a causative variant, but as a nominative or an accusative subject in an infinitival anticausative variant.

The examples in (21) below illustrate linking rule (1) in an anticausative variant and (22) represents the linking algorithm:

(21) a. cəne bʰʊn gə-e / ja-te hɛ̃
chickpeas.M.3PL.NOM roast.NFN go-PRF.M.3PL / go-IMRF be.PRS.M.3PL
'The chickpeas roasted/roast.'
b. cəne/cənũ=ko dəs mınəṭ mẽ bʰʊn-ne/bʰʊn-na tʰe/tʰa
chickpeas.M.3PL.NOM/=ACC ten minutes in roast-IFN be-PST.M.3PL/SG
'The chickpeas had to roast in 10 minutes.'

(22) **Anticausative: Linking algorithm**

ES: [BECOME <MANNER> [cəne < bʰʊne hue>]]
|
AS: Arg_1
|
GF: Sub+NOM/ACC
|
PS: NP + NOM/ACC V
| |
cəne/cənũ=ko bʰʊn gə-e/bʰʊn-na tʰa

'The chickpeas roasted/had to roast.'

[49] This rule is named after Levin and Rappaport-Hovav's (1995) The Directed Change Linking Rule, but the present formulation is recast in the notion of causal responsibility; moreover, the notions of external and internal arguments are avoided since Urdu is a free phrase order language and such notions may cause confusion.

[50] The direct arguments differ from oblique arguments by the fact that they are just NPs, while the oblique arguments are often PPs (see Culicover & Jackendoff, 2005). In Urdu, as detailed in section 6.2.1.4, the direct nominal arguments are marked with phonologically null nominative, but the oblique nominal arguments are expressed by NPs overtly case-marked with clitics. So in an Urdu indirect causative context, an oblique argument is an argument whose causal role is identified morphologically (by *se* clitic case).

(22) above describes an anticausative construal (BECOME-oriented resulting subevent) of a chickpea-roasting event in which one of the chickpeas' property undergoes a perceptible directed change due to which this event participant corresponds to a direct nominal form *cəne* 'chickpeas' (here *cəne* is plural form of *cəna*, which is syncretized with its singular oblique form *cəne*) and is realized as a nominative subject in both perfect and imperfect anticausative variants, as in (21a). But when this participant corresponds to an oblique nominal form *cənũ*, it is realized as a nominative or an accusative subject in an infinitival anticausative variant, as shown in (21b). The NOM-ACC alternation is semantically motivated, as already discussed in section 6.2.1.4 above. The changes in case markings and agreement patterns go side by side.

(23) and (24) below illustrate (1) above in direct and indirect causatives respectively; (25) and (26) represent their linking algorithms:

(23) a. ɔrət=ne cəne bʰun-e
woman.F.3SG=ERG chickpeas.M.3PL.NOM roast.CAUS^{d}-PRF.M.3PL
'The woman roasted the chickpeas.'
b. ɔrət cəne bʰun-ti
woman.F.3SG.NOM chickpeas.M.3PL.NOM roast.CAUS^{d}-IMPRF.F.3SG
hɛ
be.PRS.SG
'The woman roasts the chickpeas.'
c. ɔrət=ne cənũ=ko bʰun-a
woman.F.3SG=ERG chickpeas.M.3PL.ACC roast.CAUS^{d}-PRF.M.3SG
'The woman roasted the chickpeas.'
d. ɔrət cənũ=ko bʰun-ti
woman.F.3SG.NOM chickpeas.M.3PL=ACC roast.CAUS^{d}-IMPRF.F.3SG
hɛ
be.PRS.3SG
'The woman roasts the chickpeas.'

(24) a. həm= ne ɔrət=se cəne
we.1PL=ERG woman.F.3SG=INST chickpeas M.3PL=NOM
bʰʊn-va-e
roast-CAUS^{ind}-PRF.M.3PL
'We had the woman roast the chickpeas.'

b. həm ɔrət=se cəne
we.1PL.NOM woman.F.3SG=INST chickpeas M.3PL.NOM
$b^hʊ$n-va-te hɛ̃
roast-CAUS^{ind}-PRF.M.3PL be.PRS.M.3PL
'We have the woman roast the chickpeas.'

c. həm= ne ɔrət=se cənũ=ko
we.1PL=ERG woman.F.3SG=INST chickpeas M.3PL=ACC
$b^hʊ$n-va-ya
roast-CAUS^{ind}-PRF.M.3SG
'We had the woman roast the chickpeas.'

d. həm ɔrət=se cənũ=ko
we.1PL.NOM woman.F.3SG=INST chickpeas M.3PL.NOM
$b^hʊ$n-va-te hɛ̃
roast-CAUS^{ind}-PRF.M.3PL be.PRS.M.3PL
'We have the woman roast the chickpeas.'

(23a & b) illustrate that in a direct causative construal of a COS event, the event participant that undergoes a directed change is realized as a nominative direct object when it corresponds to a direct argument. And (23 c & d) illustrate that such an event participant is realized as an accusative direct object when it corresponds to an oblique argument. (24a-d) illustrates the same case patterns in an indirect causative construal of a COS event.

(25) **Direct Causative**

ES:	[ɔrət ACT] CAUSE [BECOME _{<MANNER>} [cəne <b^hʊne hue>]]]	
	|	|
AS:	Arg_1	Arg_2
	|	|
GF:	Sub	Obj^d + NOM/ACC
	|	|
PS:	NP + NOM/ERG	NP + NOM/ACC V
	|	| |
	ɔrət ϕ/*ne*	cəne/cənũ=ko b^hun-ti hɛ/-e/a

'The woman roasts/roasted the chickpeas.'

(26) **Indirect Causative**

ES:	[həm ACT]	CAUSE [ɔrət ACT]	CAUSE [BECOME _{<MANNER>} [cəne <b^hʊne hue>]]]
	|	|	|
AS:	Arg_1	Arg_2	Arg_3
	|	|	|
GF:	Sub	Obl + INST	Obj^d + NOM/ACC
	|	|	|
PS:	NP + NOM/ERG	NP + INST	NP + NOM/ACC V
	|	|	| |
	həm ϕ/*ne*	ɔrət=se	cəne/cənũ=ko b^hunva-te hɛ/-e/ya

'We have/had the woman roast the chickpeas.'

6.2.4 The Direct Cause Linking Rule.

The COS event participant that directly triggers a directed change in another participant's causally responsible property corresponds to a direct argument realized as a nominative subject in an imperfect direct causative variant, or an ergative subject in a perfect direct causative variant, but corresponds to an oblique argument realized as an instrumental oblique[51] in an indirect causative variant, and also in an anticausative variant, if there is such a participant.

(23) above illustrates that the direct cause argument's NOM-ERG case alternation is conditioned with verbal aspectual morphology. Mohanan (1990) argues that NOM-ERG alternation in general suggests a semantic conditioning of conscious choice: the ERG subject carries the meaning of deliberate action and the NOM subject carries the meaning of nondelibrate action. However, the counterexamples such as *tuufaan-ne šiišaa toḍ diyaa* 'The storm broke the glass', lead Mohanan to the conclusion that either the NOM-ERG pattern is governed by a semantic contrast not identified yet or such counterexamples are instances of lexical exceptionality. The present study holds that the semantic construct of CR serves as a factor conditioning ERG case. That is, what matters is not the sentience entities can exercise but the CR they share in an event. Whether an event participant is sentient or not, if it can trigger a directed change in a causally responsible property (ACT-orientation), it is eligible for ERG case. The factor licensing NOM-ERG alternation on the cause argument is the aspectual morphology of the verb denoting causative construal of the event.

When the direct cause argument appears in an indirect causative construal, it is invariantly realized as a *se*-instrumental oblique relation denoting the direct source of action, as shown in (24) above. As mentioned earlier, the direct cause argument can appear in an

[51] Here 'oblique' refers to a grammatical relation/function, not to a nominal form, that is concatenated with *se* clitic.

anticausative variant but as a 'demoted' argument realized as a *se*-instrumental oblique relation indicating an inadvertent action, as shown in (3) of section 6.1.1.1 and (27) below:

(27) a. ləkkəṛhare=se dərəxt kət gə-ya
woodcutter.M.3SG =INST tree.M.3SG cut.NFN go-PRF.M.3SG
'The tree got cut by the woodcutter.'
b. mʊj^{h}=se roṭi jəl gə-i
I.1SG=INST bread.F.3SG burn.NFN go-PRF.F.3SG
'The bread got burnt by me.'
c. ləṛki=se rəssi k^{h}ɪc gə-i
girl.F.3SG=INST rope.F.3SG stretch.NFN go-PRF.F.3SG
'The rope got stretched by the girl.'

6.2.5 The Indirect Cause Linking Rule.

The COS event participant that indirectly involves in a directed change in another participant's causally responsible property corresponds to the direct argument realized as a nominative subject in an imperfect indirect causative variant, or an ergative subject in a perfect indirect causative variant.

To illustrate, consider the following examples:

(28) a. kısan ləkkəṛhare=se dərəxt kət-va-ta
farmer.M.3SG woodcutter.M.3SG=INST tree.M.3PL cut-CAUS^{ind}-IMPRF.M.3SG
hɛ
be.PRS.3SG
'The farmer has the woodcutter cut the trees.'
b. kısan=ne ləkkəṛhare=se dərəxt kət-va-e
farmer.M.3SG=ERG woodcutter.M.3SG=INST tree.M.3PL cut-CAUS^{ind}-PRF.M.3PL
'The farmer had the woodcutter cut the trees.'

(28a) illustrates an imperfect context in which *kısan* 'farmer' is an indirect cause argument that stands in a distant/noncontactive casual relation to *dərəxt* 'tree' whose material integrity undergoes a change. This indirect cause argument is marked with a phonologically null default nominative case. However, when in a perfect aspectual context, it is associated with ergative *ne* clitic case. Apart from the role of verbal perfectivity in the syntactic realization of an indirect cause argument, the casual responsibility of the argument is also reflected through its

grammatical functional status and case marking. In general, an indirect cause argument acts on the intermediary instrumental causee which results in the causee acting on the patient argument. However, the causal relation between the indirect cause argument and the intermediary causee which it uses as means to accomplish the action may have different instantiations (have, make, force, cause, enable, etc.), which are open to pragmatics, that is, it is contextually specified what exactly the indirect cause argument does to the causee and what exactly the causee does to the patient. Despite the various manifestations of this argument's causal relations, its linking to syntax stays the same. (26) above illustrates the linking algorithm for indirect causative variant. The linking rules given above demonstrate how aspectual and casual information are reflected in the syntax through case marking on the syntactic arguments. Another pertinent point is that this study shows that argument structure emanating from root-and-event-schema-based lexical semantic representation reflects the semantics it inherits from their semantic sources: semantic roots and event schema. Thus, such argument structure does not abstract away entirely from the semantic information that influence the interaction between different levels of linguistic representation. The argument structure cannot account for such interaction if it is taken as merely a hierarchical organization of variables (see Grimshaw, 1990; Mohanan, 1994) bereft of semantic content which can be grammatically relevant in some other way. For instance, the semantic factors such as volitionality and causal responsibility which are relevant to argument structure processes of causativization should be represented at the argument structure level. In addition to the interaction between different levels of linguistic representation, these linking rules reflect Simpler Syntax's assumption that the syntactic movement and the concomitant hidden levels of structure resulting in structural complexity without empirical motivation can be replaced by a syntax-semantics interface principle that says that a constituent bearing such-and-such a

semantic relation may appear in such-and-such position depending on various conditions. Such a formulation of positional alternation avoids syntactic complexity and is simpler overall.

6.3 Conclusion

This chapter has addressed various aspects of the Urdu COS verbs' argument licensing with respect to the causative alternation. It argues that the both lexical semantic representation and lexical syntactic representation of an Urdu COS verb's anticausative variant are monadic. The semantic root and event schema of an anticausative variant licenses only one semantic argument, i.e., the argument whose property undergoes a change. The additional *se*-phrase cause argument with an anticausative variant is licensed by its semantic root, not by its event schema. The question of obligatory/optional arguments is addressed in terms of event complexity. Since the anticausative variants have one-participant event schema and one-participant semantic root, they have only one obligatory semantic argument which is syntactically obligatory. A direct causative variant has a complex event schema with two structure participants: the patient participant is inherited from the base anticausative form, and the cause participant is introduced by a direct causative operation such as *-a* suffixing. As to an indirect causative variant, its event structure consists of three structure participants: the patient participant comes from the base anticausative variant and the cause and the intermediary cause are introduced by an indirect causative operation such as *-va* suffixing. Being structure participants, all of the three arguments in an indirect causative variant should be semantically obligatory; however, the intermediary argument being omissible, there is no one-to-one correspondence between semantic arguments and syntactic arguments. In this case, three arguments are semantically obligatory, but only two are syntactically obligatory.

The *se*-phrase anticausative variant and the omissibility of intermediary causee in an indirect causative variant illustrate a mismatch between semantic arguments and their syntactic realizations. In this connection, the level of grammatical functions manipulates the assignments of semantic arguments to the grammatical functions, and in turn grammatical function assignment determines the syntactic position, case-marking, and agreement. Because Urdu is a case rich language, the role of case system assumes greater significance in the argument realization. The Urdu COS data shows that the change in case pattern across COS verb class indicates that case marking in Urdu has both syntactic and semantic reflexes. What counts in the interaction between lexical syntactic structure, grammatical relations and case marking is the way casual cognition is lexicalized in a language. In the Urdu COS verbal domain, for instance, the causal morphology of the direct causative variant also interacts actively in the case assignment to their syntactic arguments.

The interaction between lexical semantics, argument structure, grammatical relations and case system with respect to the Urdu COS verbs' causative alternation leads to two general principles (Causal Responsibility Principle and Event Structure Geometry Principle), and three Urdu-specific linking rules: the Directed Change Linking Rule, the Direct Cause Linking Rule and Indirect Cause Linking Rule. Since the present study is limited to COS domain only, it is likely that when its scope includes alternating verbs from other semantic domains, more refined ways of argument linking might be needed.

Chapter 7

Conclusions

Language translates meaning into sound through categorization of reality (Labov, 1973) and linguistics is intimately concerned with categorization both in its methodology and in its substance (Taylor, 1995). There is indeed no simple match-up between linguistic categories (morpheme, word, syntactic structure, etc.) and ontological categories (thing, property, event, etc.), yet they are interrelated through prototype structures. For linguists, a point of interest is to sort out those ontological categories that affect linguistic structure, taking these categories as ways in which human organize and lexicalize their experience of the world (Murphy, 2010). Moving in the direction from ontological category to linguistic category, the relevant questions about an ontological category, say, event, may include: How is an event type structured? How is the event structure realized in language? How does the ontological/semantic type of verb (motion, omission, COS, etc.) affect its morphosyntactic behavior? Such kinds of questions are likely to yield interesting insights into the nature of the lexical semantics-syntax interface, and ultimately into the nature of relation between ontology and language.

The present study is concerned with the semantic type COS verbs, and explores the nature of relation between this particular semantic type and its morphosyntactic behavior with respect to a particular grammatical phenomenon, the causative alternation, in Urdu. Since a prototypical Urdu COS verb has three morphological variants (anticausative, direct causative and indirect causative), the question is how a COS verb's base form is affected through the derivational process (causativization) both in its meaning and behavior. Ontologically, a typical COS event involves causal relation between two subevents: a causing subevent and a resulting subevent, each licensing at least one argument for event maintenance. Whether the causing

subevent is perceptibly obvious or not, a COS event is conceptually dyadic at the bare minimum. Given these facts about the ontological category of a COS event, the corresponding linguistic category, a COS verb, that serves as a predicate of a COS event, is expected to license a dyadic argument structure to lexicalize a dyadic COS event in its base form. However, the Urdu COS verbs disconfirm this simple one-to-one mapping between the semantic type of a monomorphic COS verb and its ontological category. Its morphological base form is its anticausative variant that typically lexicalizes a resulting subevent only, and thus, is monadic in its argument structure. The other two variants of COS verbs are dyadic and triadic due to the direct and indirect causativization operations respectively. Such type of causative alternation in the Urdu COS verbs has implications for argument realization theory, more so when verbs' lexical semantic representations are construed in terms of semantic roots and event schemas as two design features of verbal semantics.

For exploring the respective contributions of semantic root and event schema in the argument realization options of an Urdu COS verb's behavior, the present study conducts extensive analysis of morphosemantic as well as morphosyntactic aspects of 112 Urdu COS verbs, and reaches the following conclusions, showing that the Urdu COS verbs' causative alternation results from a complex interaction of multiple licensing factors. We divide the following into four sections corresponding to our four research questions.

7.1 First Research Question

With respect to the Urdu COS verbs' causative alternation, the first research question of this study is: Given the three morphological variants, which one is basic and which ones are derived? For addressing this question, the required COS verbal data is collected from multiple

sources (see Chapter 3) and analyzed in terms of morphological operations involved in the Urdu COS verbs' causativization. The major findings are as follows:

a. The derivational operations relating the Urdu COS verbs' causative alternation variants come in three types: concatenative, non-concatenative and trans-concatenative. The dominant patterns in direct causative derivation are *-a* suffixing, base modification (vowel shortening) + *-a* suffixing, and base modification (vowel lengthening) of the anticausative form. In indirect causative derivation, *-va* suffixing alone or with base modification of the anticausative form stands out. These derivational patterns show that the anticausative form is basic and causative forms are derivatives.The observation that indirect causative variants are typically derived by *-va* suffixation of an anticausative base, not of a direct causative form, constitutes further evidence for anticausative being the basic form. Out of total 121 derivational operations found in 82 alternating COS verbs, 94.21% apply to anticausative bases. Such morphological facts of Urdu verbs even in one semantic field (COS domain) do not support Saksena's (1982) observation that in Hindi-Urdu, Intr → Tr is not a productive rule, but Tr → Intr is because where there are gaps in the data, given a Tr verb, a speaker can usually form a corresponding Intr verb. That morphological evidence can be used to make a base/derivative distinction also differs from Richa's (2008) observation that arguments from morphology are not valid for such a distinction; rather, this distinction should be made on a syntactic or a semantic basis. In this connection, Richa refers to Bhatt & Embick (2004) who argue that Hindi has two sets of verbs: the AA-class, where the transitive forms have an overt suffix *-a*, as in *suk*^{h} 'Y become dry' and *sʊk*^{h}*a* 'X cause Y to become dry', and the NULL-class that is without any overt suffix, as in *mər* 'Y become dead' and *mar* 'X cause Y to become

dead'. In the AA-class, the intransitive form appears to be basic and in the NULL-class, it is the transitive form which is basic. Bhatt & Embick conclude that one single rule of Vowel Simplification (shortening of the vowel) operates to derive transititives from intransitives in the AA-class and intransitives from transitives in the NULL class. However, this study finds that derivation is not just a matter of vowel simplification; much more is involved (see Chapter 4). The study concludes that Urdu-Hindi has morphologically mediated directed alternation.

b. The fact that not all Urdu COS verbs morphologically participate in mapping from anticausative onto direct and indirect causatives, and thus do not always result in a three-term paradigm suggests, that the derivational rules are not fully and equally productive. Morphological productivity in the Urdu COS verbs' causative derivation is scalar rather than categorical: apart from productive and unproductive rules, there are also rules of semi-productivity. In direct causative derivation, for instance, base modification (vowel lengthening) is more productive than *-a* suffixation alone in that the former creates a larger number of direct causative forms. Conversion, suppletion and *-va* suffixing appear to be unproductive since their application domain is very limited. In indirect causative derivation, *-va* suffixation is the most productive operation. The variable productivity indicates phonological, morphological, syntactic and semantic constraints on these morphological processes. These constraint-based derivational operations show that morphology serves as an interface below the level of word.

c. During eliciting responses through dialogical introspection, it was observed that some Urdu speakers use even those variants of COS verbs which were not available in Urdu WordNet and Urdu Lughat. This led to the comparison between data from Urdu WordNet

plus Urdu Lughat and judgment data from Urdu speakers. The comparison was motivated by the assumption that morphological rules are part of speakers' linguistic competence and can extend their existing domain of application, by producing new formations. So without the constraints of speakers' acceptability judgments, it is difficult to say what is possible and what is not. The comparison shows that at least 12 non-alternating verbs have assumed the status of alternating verbs and some 2-variant verbs have become 3-variant verbs. This indicates the dynamic nature of morphological productivity. Now the question arises why a productive rule does not produce variants it is expected to do. As stated above, the domain of a productive rule being less than the entire word-class implies constraints on the rule. The hypothetical formations presented to speakers in the acceptability judgment task reveal that the productivity of the Urdu causative operations depends primarily on the phonological and semantic regularity of new formations, that is, a morphologically possible variant is blocked by phonological or semantic similarity with other available words in the language. The difference between actual and possible words also supports Haspelmath's (2002) observation that morphological competence and performance are not conceptually quite distinct, and should be studied in unison.

7.2 Second Research Question

The second research question this study poses is: How does the morphological structure relate to the lexical semantic structure? In answer, the study finds the following.

a. The various characteristics of morphological knowledge (gradability, domain extendibility and constraints of various types) detailed in Chapter 4 suggest that such type of knowledge is more likely to be schemas representing the common features of morphologically related words, and causative derivation shows an interaction between

schemas. The Urdu COS data reveals that an Urdu COS anticausative form is a mono-morphemic predicate in that it is morphologically simple, carrying no (in)transitivity marker, and its sole argument is lexically encoded. In addition to argument-taking ability, the anticausative root also possesses conceptual content and temporality, the properties considered necessary for predicatehood. For causative derivation, derivational operations manipulate information encoded in an anticausative mono-morphemic predicate. Such a manipulation can be defined over the event structure of an anticausative form. The morphological complexity in causative derivatives reflects event schema complexity which, in turn, results in argument structure complexity. This effect on the lexical syntactic side is due to the fact that the morphological processes operating on the anticausative base morphologically mark the CAUSE relation defined in terms of causal responsibility in this study, which is otherwise conceptually available but lexico-semantically not encoded. In other words, the Urdu COS verbs' causative derivation operates over lexical semantic representation as well as lexical syntactic representation. However, the omissibility of an intermediary subevent in an indirect causative construction provides empirical support that lexical semantic representation and lexical syntactic representation are distinct but related levels of lexical representation.

b. The Urdu COS verbs' causativization process involves interaction between all the three aspects of lexical items: phonology, syntax and semantics, and has implications for the nature of the lexicon and lexical items. The effects of interaction between anticausative COS roots and causative affixes are evident in the phonological structures of the resultant causative variants. The interaction between the syntactic category of the root and the causative morpheme is also subject to constraints. Like morphophonological and

morphosyntactic constraints, morphological operations delimit the range of meanings too. The suffixes *-a* and *-va* involved in the Urdu COS verbs' causativization, thus, can be treated as lexical items that provide an interface between pieces of phonology, syntax, and semantics. It is in this sense that lexical items serve as interface constraints, and the lexicon as a whole is to be regarded as part of the interface components.

c. Given the facts that the anticausative root must be stored in the lexicon, i.e., in long-term memory because it cannot be constructed online from smaller parts in the absence of productive morphology, and that both direct and indirect causative variants can be constructed online from constituent units (roots and affixes) via derivational processes, the question arises of whether the lexicon stores all the derived causative variants along with the anticausative base form. In this regard, the present study argues that both an Urdu COS anticausative base and causative morphemes as lexical items are stored in long-term memory, but grammatical words (both causative derivatives) are built online out of constituent lexical items (the anticausative root + *-a* and *-va* affixes in our case) in working memory. What counts is the distinction between productive and semiproductive lexical rules. Productive morphology is regular, except where the meta-constraint of morphological blocking supplants regular forms. Unlike a productive lexical rule, one cannot apply a semiproductive rule to a stem unless one actually knows that the rule applies to it. However, the dynamic potential in derivational morphology indicates that as long as semiproductive rules do not become productive, they must be listed in long-term memory; they cannot be a product of free combination. Overall, the study concurs with Jackendoff's (2002) position that semiproductive generalizations are indeed lexical rules, but speakers must learn one by one the lexical items that the rule applies to. In

contrast, productive generalizations result from the free combination of individual morphemes that are stored as separate lexical items. The gradient nature of morphological productivity suggests that morphological rules/schemas can be used both generatively and relationally (Jackendoff & Audring, 2020).

7.3 Third Research Question

The third research question is: How does a semantic root relate to an event schema in a verb's semantic representation? In this regard, the study comes to the following conclusion.

a. Given that Urdu has morphologically mediated directed causative alternation where an anticausative is basic and causatives are derivatives, it is important to find out what is encoded in the Urdu COS verbs' semantic roots and how these semantic roots combine with event schemas within their lexical semantic representation. The CR-based directed change diagnostic as well as conjunctive participle construction diagnostic reveal that the semantic root of a COS verb encodes both manner and result, and its event structure is as follows: [BECOME$_{<MANNER>}$ [Y< *STATE*>]]. This event structure differentiates not only between what are traditionally called manner and result verbs, but also between members of the same result class, say, between breaking and shattering. It also enables the anticausatives to retain their manner component.

b. In order for an anticausative version of a COS verb to express the intended message, the patient argument is conceptually, semantically as well as syntactically obligatory, but what is the status of the cause argument, given that a COS event is never uncaused? In this regard, COS anticausatives split into BECOME-oriented and ACT-oriented types with respect to the way they presuppose the distribution of CR between the event participants. Both types of anticausatives presuppose an external causation, but it is only

the BECOME-oriented type that allows for the possibility of internal causation. In contrast, ACT-oriented COS verbs presuppose the involvement of external, but not internal, cause argument. However, at the linguistic semantic level, both BECOME-oriented and ACT-oriented anticausatives lexicalize only the resulting subevent without marking any cause argument in their lexical semantic structures; in both cases, cause arguments remain available as conceptual content to which the lexical semantic content of the anticausatives offer access, and support conceptual inferences. The cause arguments that are optional in anticausatives, when overtly realized in causatives, are semantically stipulated by the type of a COS verb (BECOME-oriented or ACT-oriented). Such licensing conditions imposed by an anticausative indicate that a verb as an interface rule specifies the contextual features within which the correspondence is licensed between a piece of phonology, a piece of semantics and a piece of syntax.

c. As to the semantics of direct causatives, it results from the interaction of anticausative semantics and the semantics of a direct causative derivational operation (e.g., *-a* suffixation and base-modification + *-a* being dominant operations). The semantics of derivation results in a single referential unit created out of two distinct semantic skeletons (e.g., schematic structures of base and affix) such that the affixal skeleton subordinates the base skeleton. The affixal semantic body (semantic root) can place on a skeletal argument the semantic constraints like being sentient and volitional to ensure semantic consistency with its base where the main semantic source (battlefront) is the causally responsible property ‘P^r’of the patient argument that is activated in a COS event. In direct causative derivation, the affix *-a* adds a function to its base skeleton, with respect to event complexity, the function CAUSE added by *-a* overtly marks the CR relation between a

resulting subevent encoded in the anticausative base form and the causing subevent which is otherwise cognitively present but linguistically absent in the anticausative form. The addition of the CAUSE function represents a highly constrained interaction of anticausative semantics and the semantics of direct causative derivational operation. For instance, the added material must be compatible with the anticausative's root semantics and the augmented event structure must be that of a possible lexical item.

d. In the case of indirect causatives, the morpheme *-va* is typically suffixed to the anticausative base and adds two CAUSE functions introducing two causing subevents: a direct causing subevent which represents a CR relation between the patient argument and intermediary causee (direct cause argument), and an indirect causing subevent which represents a CR relation between the patient argument and the indirect cause argument. Owing to the two CAUSE functions, the lexical semantic representation of indirect causative in Urdu embodies two ACT predicates, one associated with indirect cause and one associated with direct (intermediate) cause. This fact about the Urdu COS indirect causatives offers evidence that COS verbs associate manner with a BECOME predicate to specify a result state; otherwise, the association of manner with two ACT predicates requires the manner compatibility between the two functions, which is not possible in the presence of indirect and direct causes which are two different entities with different CR relations in a COS event. A semantic root inherited from an anticausative base cannot modify both ACT predicates simultaneously because its lexical semantic representation does not incorporate any cause argument, direct or indirect, without further morphosyntactic aid. As to the derivational morpheme *-va*, it cannot modify any ACT predicate because it is semantically parasitic on its lexical base. The impossibility of

manner compatibility between two causes in an indirect causative COS event also implies a condition on the number of root categories a COS verb in its basic form can lexicalize: a COS verb can have two root categories (manner and result), but cannot have more than one manner or more than one result root.

e. The Urdu indirect causatives have also implications for event schema inventory. As stated above, the event schema for an Urdu indirect causative is unique in the sense that it incorporates both direct and indirect causes and thus contains more semantic primitives than those in anticausative and direct causative. For accommodating the facts of the Urdu indirect causatives, Rappaport-Hovav and Levin's (1998a) event schema inventory needs to include an indirect causative's complex event schema. In the light of overall discussion on the morphological and semantic derivations of the Urdu COS verbs, and the nature of the relation between semantic root and event schema within a COS event structure, this study proposes the following inventory of event structures for the Urdu COS verbs:

a. [BECOME $_{<MANNER>}$ [Y <*STATE*>]] Anticausative

b. [X ACT] CAUSE [BECOME$_{<MANNER>}$ [Y <*STATE*>]]] Direct causative

c. [Z ACT] CAUSE [X ACT] CAUSE [BECOME $_{<MANNER>}$ [Y<*STATE*>]]]] Indirect causative

7.4 Fourth Research Question

The fourth research question of this study is: How does a root-event schema-based representation map onto a syntactic representation? In this connection, the present study's focus is on argument linking/licensing which involves the relationship between lexical semantic structure, argument structure, grammatical relational structure and phrase structure. More specifically, the problems addressed here are: given a root-event-schema-based lexical semantic

representation of a COS verb, (a) how are the semantic arguments of an Urdu COS verb realized as syntactic categories, and (b) how does an Urdu COS verb code for the causative alternation? In this regard, the study finds the following.

a. Semantically, an anticausative base lexicalizes the directed change (a BECOME-construal), and thus, its event schema licenses only one semantic argument, i.e., the argument undergoing a change and ending up in a result state. Since a semantic root, as pointed out by Levin (2009), must specify the minimum number of event participants, a COS anticausative root licenses only one argument (the patient), which is paired with an argument position in event schema. However, an Urdu anticausative form allows for the cause argument in non-subject position, marked by the instrumental case clitic *se*, as in *gılas* ***ləṛke= se*** *ṭuṭ gə-ya* 'The glass got broken by the boy.' In such cases, the instrumental *se*-phrase introduces a cause argument, but assumes neither the semantics nor the syntax of a direct causative variant in which the cause argument is in subject argument position and indicates a volitional participation of the cause argument as well as the causing subevent perspective when the cause argument is sentient. When a *se*-phrase denotes some non-sentient cause argument such as a natural force, as in *gılas tez* ***həva=se*** *ṭuṭ gə-ya* 'The glass broke due to the fast wind', the anticausative *se*-phrase use, like its direct causative version, implies not volitionality but only a change in perspective on the event: the anticausative version indicates a resulting subevent perspective and the direct causative version shows a causing subevent perspective. Since an anticausative does not lexicalize the CAUSE relation, its event schema is not supposed to license a cause argument. So the additional *se*-phrase argument is licensed by its semantic root, not by its event schema, that is, in this particular use of the anticausative variant with two

arguments, one is structure (event schema) participant and the other is a root participant. As to the cause arguments in direct and indirect causative variants, they are introduced by direct and indirect causative operatons such as *-a* suffixing and *-va* suffixing respectively. That is, they are obligatorily event schema participants, not root participants, due to their being morphologically complex predicates.

b. The question of obligatory/optional arguments can be addressed in terms of event complexity. In their anticausative use, the Urdu COS verbs do not semantically entail a CAUSE relation and encode only a resulting event (i.e., a simple event), and thus, have one-participant event schema and one-participant semantic root. Consequently, an anticausative form has only one obligatory semantic argument which is realized syntactically. Any other argument such as a *se*-phrase cause argument is licensed by the otherwise one-participant root and would be an optional semantic argument. In a direct causative variant, both arguments realize structure participants because this variant has a complex event schema with two structure participants: the patient participant shared by both event schema and root of the anticausative variant being a basic form, and the cause participant introduced by a direct causative operation such as *-a* suffixing. As to an indirect causative variant, its event structure consists of three structure participants: the patient participant is shared by both event schema and semantic root of the base variant, and the other two (the cause and the causee/intermediary participant) are introduced by an indirect causative operation such as *-va* suffixing. Being structure participants, all of the three arguments in an indirect causative variant should be semantically obligatory; however, the intermediary argument is omissible, so there is no one-to-one correspondence between semantic arguments and syntactic arguments. In this case, three

arguments are semantically obligatory, but only two are syntactically obligatory. The reason for this unusual behavior is that the distribution of CR relation among the COS event participants encoded by an indirect causative variant is different from that encoded by a direct causative variant.

c. Having made clear the licensing as well as the obligatory/optional status of the arguments of a COS alternating verb's three variants, the next question concerns the syntactic realization of these semantic arguments with respect to the causative alternation. In a concrete COS event domain, a verb invariably takes semantic arguments of ontological type "objects" which are typically expressed as NPs. What is needed is the semantic compatibility between the lexical profile of a COS verb and those of its arguments in terms of CR relation which is reflected in their predicate's event structure. What counts as a cause or a patient in a COS event is encoded as part of a COS verb's semantic content through the semantic prime CAUSE and its relation with the semantic primes ACT and BECOME. Such a relation between a COS verb and its semantic arguments indicates "causal responsibility correspondence" (CRC) which, then, determines the formal combinatorics of a COS verb and its arguments by virtue of the semantic selectional tendencies they share. Although the syntactic category of a COS verb's semantic argument is fairly predictable on semantic grounds, the verb still can constrain the syntactic realization of its semantic arguments. The *se*-phrase anticausative variant and the omissibility of intermediary causee in an indirect causative variant illustrate a mismatch between semantic arguments and their syntactic realizations. If a semantic argument denotes a physical object, it is standardly realized as an NP in syntax; however, in *se*-phrase anticausative variant, it is realized as an oblique NP argument, rather than as

a direct NP argument. In an indirect causative variant, the causee argument, when present, is realized as an instrumental *se*-phrase.

d. The cases like *se*-phrase anticausative variants and the omissibility of an instrumental *se*-phrase in indirect causatives, as discussed above, indicate that the mapping between argument structure and phrase structure is not one-to-one, and suggest that there is another syntactic level that manipulates the status of syntactic arguments irrespective of their semantic status and their syntactic position. It is this syntactic level of grammatical functions which assigns semantic arguments to grammatical functions, and allows grammatical functions to map to different phrase structure realizations in different languages: in some languages such as English, they map to fixed positions, while in other languages such as Urdu, they map to case marking. Concerning the role of the case system in argument linking with respect to the causative alternation, the study finds the following. The Urdu intransitives show an ergative/nominative alternation on subjects, which seems to be sensitive to volitionality. But COS unaccusative verbs are not compatible with ergative subjects even when they are used with a cause argument having non-volitional interpretation; there is no change in the subject argument's case status due to its overall patientive semantics, though the cause argument is marked with instrumental *se* case instead of the ergative or nominative typical of a cause argument. However, this study has found only one syntactic context, verbal infinitival morphology, to which a COS anticausative shows sensitivity and optionally takes accusative case clitic *ko* in subject position, and may have habitual, or desiderative interpretation. In contrast to anticausative variant, the case marking on subject arguments in both direct and indirect causative variants are very much sensitive to aspectual morphology on the verb. In a

perfect transitive context, the canonical case pattern in the direct causative variant is ergative-nominative; however, in an imperfect transitive context, the pattern is nominative-nominative. This change in case pattern across the COS verb class indicates the sensitivity of case marking to verbal aspectual morphology, but carries no semantic entailment. The possibility of semantic entailment arises when case alternation (nominative-accusative) appears on the object arguments in the same perfect transitive context. The case alternation in the direct causative variant, either on subject or object arguments, also signals semantic differences (specificity/obligation) in the overall interpretation of the clause. However, it does not change the causal status of the arguments in the COS event. In other words, the semantic contribution of obligation/ specificity does not affect their CR status; it does not make any difference whether some causal event is volitional or not, and some event participant is definite or not; what counts in the interaction between lexical syntactic structure, grammatical relations and case marking is the way causal cognition is lexicalized in a language.

e. The examination of various aspects of the Urdu COS verbs with respect to the causative alternation leads us to two main general assumptions: Event Structure Geometry Principle (linking reflects event structure geometry), and Causal Responsibility Principle (the distribution of casual responsibility among event participants is pertinent to determining the basic adicity of verbs describing those events). The data analysis, when couched in terms of these two principles, leads us to the following linking rules:

    1. The Directed Change Linking Rule

       The COS event participant whose causally responsible property undergoes a directed change corresponds to either a direct or an oblique argument. When

direct argument, it is realized as a nominative subject in an anticausative variant, but as a nominative direct object in a causative variant. When oblique argument, it is realized as an accusative direct object in a causative variant, but as a nominative or an accusative subject in an infinitival anticausative variant .

2. The Direct Cause Linking Rule

   The COS event participant that directly triggers a directed change in another participant's causally responsible property corresponds to a direct argument realized as a nominative subject in an imperfect direct causative variant, or an ergative subject in a perfect direct causative variant, but corresponds to an oblique argument realized as an instrumental oblique in an indirect causative variant, and also in an anticausative variant, if there is such a participant.

3. The Indirect Cause Linking Rule

   The COS event participant that indirectly involves in a directed change in another participant's causally responsible property corresponds to the direct argument realized as a nominative subject in an imperfect indirect causative variant, or an ergative subject in a perfect indirect causative variant.

These linking rules show how aspectual and causal information are reflected in syntax. The argument structure reflects the semantics it inherits from the semantic sources of roots and event schema, and does not abstract away entirely from the semantic information that influences the interaction between different levels of linguistic representation. In addition, these linking rules reflect the assumption that the syntactic movement and the concomitant hidden levels of structure resulting in structural complexity without empirical motivation can be replaced by constraint-based syntax-semantics interface principles. The bottom line is that such a syntax-

semantics interface formulation of alternation avoids syntactic complexity. It is worth emphasizing that since the present study is limited to COS domain only, it is likely that when its scope includes alternating verbs from a variety of semantic domains, more refined approaches to argument linking will be needed to accommodate new observations.

7.5 Areas for Future Study

The main contribution of this study is to characterize the Urdu COS verbs' causative alternation in terms of SEMANTIC ROOT and EVENT SCHEMA defining the event schema predicate CAUSE in terms of CAUSAL RESPONSIBILITY. To explore the relevance of semantic root and event schema in the argument realization options, the study conducts analysis of both morphosemantic and morphosyntactic aspects of the Urdu COS verbs, showing that the Urdu COS verbs' causative alternation results from a complex interaction of multiple licensing conditions at various levels of linguistic representation. Along the way, the study suggests a number of areas for future research.

As mentioned in Chapter 3, the Urdu COS predicates fall into three broad categories: simple predicates, complex predicates and even predicates. A simple predicate is a single lexical item, but a complex predicate comprises two individual predicates of which the first predicate can be a verb, a noun or an adjective, and the second predicate is a light verb. An even predicate comprises two semantically related verbs whose meaning together that might not be exactly the same as those of constituent verbs. Complex predicates invariably alternate but simple and even predicates might be alternating or non-alternating in their behavior. However, in view of the scope of the present study, the empirical focus remained on simple predicates. The nature of semantic and syntactic argument fusion in complex and even predicates in terms of the semantic root and event schema itself constitutes a research problem for future study. Such an exploration would definitely help understand the composition of, say, two otherwise independent verbs'

lexical semantic representations into a complex semantic representation of a resultant predicate, and its effect on a complex predicate's argument structure realization options. The interaction between two individual semantic roots and two individual event schemas would help explicate the nature of semantic primes lexicalized in individual verbs. More specifically, the relevant questions may include: what lies in CAUSE prime (its properties)? How does it interact with ACT and BECOME primes to influence a complex predicate's argument structure? If a semantic root (idiosyncratic meaning) remains constant over various uses of the verb in different contexts, it follows that a semantic root cannot be the source of different types of causal responsibility (CAUSE). On the other hand, an event schema cannot vary from verb to verb within a semantically coherent verb class because it is shared by all class members. Given these considerations, what then is the source of variable causal semantics?

Since the semantic structure of an anticausative variant represents only a resulting subevent in a COS event, and thus, does not encode a CAUSE relation, its event schema is not supposed to license a cause argument. However, the *se*-phrase cause argument with an anticausative variant is licensed by its semantic root. The event schema of this particular use of an anticausative base resembles that of a direct causative variant ([X ACT] CAUSE [BECOME $_{<MANNER>}$ [Y<*STATE*>]]]), but differs from it in terms of CAUSE relation (the nature of causal responsibility) between two subevents, which is non-volitional in *se*-phrase anticausative variant, and volitional in direct causative variant when the causally active entity is sentient. This particular aspect of causal semantics cannot be captured by a typical direct causative variant and needs further investigation for accommodating it within a root-event schema-based event structural approach to lexical semantics. Although CAUSE is taken to be only one prime for causation that involves all semantic types of causation (e.g., contact/distant and

permissive/coercive causation), it is still not clear whether such semantic differences can be accounted for lexically or contextually, avoiding unnecessary proliferation of CAUSE primes. Future research should explore the nature of such semantic nuances and find a way to incorporate them in lexical decompositions.

As stated in Chapter 2, in addition to the lexically specified aspects of verb meaning, a comprehensive account of causative alternation verbs must also consider nonlexical factors concerning this phenomenon. The present study does touch in places on the pragmatic factors constraining certain aspects of the Urdu COS verbs such as the distribution of variants in the given discourse context and the obligatoriness or optionality of certain semantic and syntactic arguments, yet it primarily addresses the lexical factors. The non-lexical aspects of the Urdu causative alternation are worth pursuing in future research. In this connection, Rappaport-Hovav (2014a), as mentioned earlier, provides useful guidelines based on Grice's (1967/1989) rational reconstruction of inferential view of the implicit side of verbal communication. In the context of the Urdu COS verbs' causative alternation, a relevant question would be: What constrains the distribution of the causative alternation variants in the given discourse context? An alternative theoretical apparatus to account for the contextual constraints might be Relevance theory (Sperber & Wilson, 1986/1995; Wilson & Sperber, 2012) which incorporates Grice's account into a psychologically plausible, empirically testable theory of overt communication (Wilson, 2017). According to this theory, everything else being equal, the greater the positive cognitive effects achieved (e.g., true contextual implications, or warranted strengthenings or revisions of existing assumptions), and the smaller the mental effort required (to represent the input, access a context and derive these cognitive effects), the greater the relevance of the input (whether external stimuli, which can be perceived and attended to, or internal representations, which can

be stored, recalled, or used as premises in inference) to the individual at the time. About the role of relevance in cognition and communication, Relevance theory makes two general claims: Cognitive Principle of Relevance (human cognition tends to be geared to the maximization of relevance), and Communicative Principle of Relevance (every act of overt communication conveys a presumption of its own optimal relevance).The theory yields a variety of predictions about human cognitive processes. For instance, to succeed in communication, the communicator needs his audience's attention so that the audience may take the utterance to be relevant enough to be worthy of attention. In Relevance-theoretic terms, the contextual constraints on the distribution of the causative alternation variants calls for an analysis of the language users' contextual choice of variants for becoming optimally relevant in the production task.

7.6 Concluding Remarks

Overall the study shows that the event structure account of the Urdu COS verbs' causative alternation supports the decomposition of the grammar into independent generative components that interact through interface rules. Multiple argument realization such as causative alternation can be accounted for only in a system that accommodates rich syntax-semantics interface principles. Thus, neither a syntactocentric nor a semanticosentric system can do justice to complex linguistic phenomena that involve more than one levels of linguistic representation. This study concludes that the facts of argument structure provide evidence for a constraint-based parallel architecture. The present analysis of the Urdu COS verbs' causative alternation is set within the frameworks of Rappaport-Hovav and Levin's root-event schema-based event structure and Culicover and Jackendoff's Simpler Syntax. Though the particular formulations in this work depart from their theoretical positions at certain places to cover the various aspects of the Urdu COS verbs' causative alternation, the account reflects similar insights.

Appendix A

List of the Urdu COS Verbs (n=112)

#	Verb
1.	ابل ʊbəl ‘boil’
2.	اپھر əpʰər ‘distend, swell’
3.	اجڑ ʊjəɽ ‘ruin’
4.	اُجل ʊ.jəl ‘brighten’
5.	ادھڑ ʊdʰəɽ ‘open at the seams’
6.	اَکڑ əkəɽ ‘stiffen.
7.	اگ ʊg ‘grow’
8.	بٹ bəʈ ‘divide’
9.	بجھ bʊjʰ ‘extinguish’
10.	بدل bədəl ‘change’
11.	برفا bərfa ‘freeze’
12.	برقا bərqa ‘electrify’
13.	بَرما bərma ‘drill’
14.	بڑھ bəɽʰ ‘increase, enlarge, etc.
15.	بُس bʊs ‘become stale’
16.	بگڑ bɪgəɽ ‘worsen’
17.	بگھار bə.gʰar ‘fry’
18.	بلو bɪlo ‘churn’
19.	بھن bʰʊn ‘roast’
20.	بھیگ bʰig ‘wet’
21.	بھڑک bʰəɽək ‘burst into flame’
22.	بیل bel ‘expand with rolling pin’
23.	پتھرا pətʰra ‘petrify’
24.	پچک pɪ.cək ‘flatten’
25.	پس pɪs ‘pulverize’
26.	پک pək ‘cook, ripen’
27.	پگھل pɪ.gʰəl ‘melt’
28.	پِلپِلا pɪl.pɪ.la ‘pulp’
29.	پِل pɪl ‘crush for oil/juice
30.	پَنپ pə.nəp ‘grow’
31.	پھٹ pʰəʈ ‘burst, explode, tear’
32.	پھُوٹ pʰuʈ ‘bloom’
33.	پھَل pʰəl ‘bear fruit’
34.	پھُل pʰʊl ‘flower’
35.	پھول pʰul ‘distend, swell, inflate’
36.	پھیل pʰel ‘expand’
37.	تا ta ‘heat’
38.	تپ təp ‘heat up’
39.	ترش tə.rəʃ ‘slash, chip’
40.	تڑخ tə.ɽəx ‘crack’
41.	تڑک təɽək ‘crack’
42.	تل təl ‘fry’
43.	تَمتَما təm.tə.ma ‘redden’
44.	تن tən ‘stretch, stiffen’
45.	تھَرتھَرا tʰərtʰəra ‘vibrate’
46.	تھُڑ tʰʊɽ ‘lessen, shorten’
47.	ٹوٹ ʈuʈ ‘break’
48.	ٹھٹھر ʈʰɪʈʰər ‘chill/shiver with cold’
49.	جاگ jag ‘wake’
50.	جل jəl ‘burn’
51.	جم jəm ‘freeze’
52.	جُھلس jʰʊləs ‘sear, char, scorch’
53.	چانڈ cãɖ ‘flatten’

54. چَب cəb ‘crush with teeth’
55. چٹخ cəṭəx ‘crack’
56. چٹک cəṭək ‘crack’
57. چُرمر curmʊr ‘shatter’
58. چر cır ‘rip’
59. چمک cəmək ‘brighten’
60. چُور cur ‘break into pieces’
61. چھد c^{h}ıd ‘drill, develop a hole’
62. چھل c^{h}ıl ‘chip, bruise, peel’
63. چھن ʃən ‘strain’
64. چِیتھ cit^{h} ‘flatten/crush with teeth’
65. خَراد xərad ‘chip with lathe’
66. خَم xəm ‘bend, twist’
67. دغ dəɣ ‘burn skin with iron’
68. دبلا dʊb.la ‘slim’
69. دَل dəl ‘crush coarsely’
70. دہک dəhək ‘burn and glow’
71. دھندلا d^{h}õd.la ‘blur’
72. دھن d^{h}ʊn ‘card cotton’
73. ڈھے ḍ^{h}e ‘collapse’
74. ڈوب ḍub ‘drown’
75. رنگ rə̃g ‘color, dye’
76. رُندْ rõd ‘trample, crush’
77. سدھر sʊ.d^{h}ər ‘improve’
78. سڑ səṛ ‘rot, decompose, putrefy’
79. سکڑ sʊkəṛ ‘shrink, contract’
80. سلگ sʊ.ləg ‘kindle’
81. سَنسَنا sən.sə.na ‘simmer’
82. سوج suj ‘swell’
83. سوکھ suk^{h} ‘dry, desiccate’
84. سَنک sĩk ‘heat up on fire’
85. سَنولا səṽ.la ‘tan’
86. قلما qəl.ma ‘make crystal’
87. کتر kʊtər ‘snip’
88. کٹ kəṭ ‘cut’
89. کٹ kʊṭ ‘crush into small pieces’
90. کچل kʊcəl ‘crush’
91. کڑوا kəṛ.va ‘bitter’
92. کڑھ kəṛ^{h} ‘boil (milk) for cream, etc.’
93. کس kəs ‘tighten, tauten’
94. کملا kʊm.la ‘wither’
95. کھچ k^{h}ıc ‘stretch, tense’
96. کھلا k^{h}ıl ‘bloom’
97. کھول k^{h}əl ‘boil’
98. گاہ gah ‘crush crop with roller’
99. گر gır ‘collapse, demolish’
100. گل gəl ‘rot, decompose’
101. گھٹ g^{h}əṭ ‘abate, decrease, reduce’
102. گھٹ g^{h}ʊṭ ‘crush’
103. گھڑ g^{h}əṛ ‘chip, make’
104. گھِس g^{h}ıs ‘abrade, fray’
105. گھل g^{h}ʊl ‘dissolve’
106. گھنگرا g^{h}õg.ra ‘curl (hair)’
107. مرجھا mʊrj^{h}a ‘wither, shrivel’
108. مر mər ‘die’
109. مڑ mʊṛ ‘bend’
110. مسل məsəl ‘crush’
111. نِتھر nıt^{h}ər ‘percolate, strain’
112. نرما nərma ‘mellow, soften’

Appendix B

Acceptability Judgment Task

تبدیلیِ حالت افعال کی تعدی حیثیت

عمر _____ جنس _____

مادری زبان _____ تعلیم _____

اردو بولنے کا تجربہ _____

ہدایات

درج ذیل سوالنامے میں ہر اردو فعل کی تین صورتیں دی گئیں ہیں۔ ہر صورت کے سامنے اس کا جملہ دیا گیا ہے۔ آپ نے بتانا ہے کہ ایک جملہ فعل کی دی ہوئی صورت کے ساتھ آپ کو کیسا لگتا ہے۔ اس کے لیے آپ نے ہر جملے کے دائیں طرف دی ہوئی درجہ بندی میں سے متعلقہ خانے میں دائرہ لگا دینا ہے۔ درجہ بندی میں دیئے گئے اعداد کے مطالب کچھ یوں ہیں۔

۱ - **بلکل درست:** فعل کی یہ صورت مکمل طور پر ٹھیک ہے اور میں بوقت ضرورت اسے استعمال کر سکتا/سکتی ہوں۔

۲ - **مناسب:** فعل کی یہ صورت مکمل طور پر تو ٹھیک نہیں، لیکن میں بوقت ضرورت اسے استعمال کر سکتا/سکتی ہوں۔

۳ - **عجیب:** فعل کی یہ صورت عجیب سی لگتی ہے اور مجھے بوقت ضرورت اس کے استعمال پر شک ہے۔

۴ - **بلکل درست نہیں:** فعل کی یہ صورت بوقت ضرورت ناقابل استعمال ہے۔

افعال	جملے	درجہ بندی			
۱۔ ابلنا					
ابلنا	دودھ ابل رہا ہے	۱	۲	۳	۴
ابالنا	میں نے دودھ ابال دیا ہے	۱	۲	۳	۴
ابلوانا	میں نے دودھ اپنی بہن سے ابلوالیا ہے	۱	۲	۳	۴
۲۔ اُپھرنا					
اپھرنا	اس کا پیٹ اپھر گیا	۱	۲	۳	۴
اپھرانا	اس نے اپنا پیٹ اپھرالیا	۱	۲	۳	۴
اپھروانا	ماں نے حکیم سے اس کا پیٹ اپھروادیا	۱	۲	۳	۴
۳۔ اجڑنا					
اجڑنا	ان کا گھر اجڑ چکا ہے	۱	۲	۳	۴

اجاڑنا	میں تمہارے گھر کو اجاڑوں گا	۱	۲	۳	۴
اجڑوانا	مالک نے غلام کا گھر اپنے لوگوں سے اجڑوادیا	۱	۲	۳	۴
۴۔ اُجَلنا					
اجلنا	اب یہ کپڑے اجل گئے ہیں	۱	۲	۳	۴
اجالنا	دھوبی نے کپڑے اجال دیئے ہیں	۱	۲	۳	۴
اجلوانا	انھوں نے دھوبی سے کپڑے اجلوالیے	۱	۲	۳	۴
۵۔ اُدھڑنا					
ادھڑنا	یہ غلاف ادھڑ گیا ہے	۱	۲	۳	۴
ادھیڑنا	اس نے سارے غلاف اُدھیڑ دیے	۱	۲	۳	۴
ادھڑوانا	میں نے عورتوں سے سارے غلاف اُدھڑوادیئے	۱	۲	۳	۴
۶۔اکڑنا					
اکڑنا	روٹی اکڑ گئی	۱	۲	۳	۴
اکڑانا	لڑکی نے روٹی اکڑادی	۱	۲	۳	۴
اکڑوانا	لڑکی نے اپنی بہن سے روٹی اکڑوادی	۱	۲	۳	۴
۷۔ اگنا					
اگنا	باغ میں لگائے گئے پودے اگ رہے ہیں	۱	۲	۳	۴
اگانا	اس زمیں پر کسان پودے اگا رہا ہے	۱	۲	۳	۴
اگوانا	افسر نے کھیل کے میدان میں نوکروں سے پودے اگوادیئے	۱	۲	۳	۴
۸۔بٹنا					
بٹنا	زمین کا یہ ٹکڑا چار حصّوں میں بٹ گیا	۱	۲	۳	۴
بانٹنا	باپ نے زمین کا یہ ٹکڑا چار حصّوں میں بانٹ دیا	۱	۲	۳	۴
بٹوانا	بیٹوں نے باپ سے زمین کا یہ ٹکڑا چار حصّوں میں بٹوادیا	۱	۲	۳	۴
۹۔بجھنا					
بجھنا	آگ بجھ گئی	۱	۲	۳	۴
بجھانا	سبھی نے مل کر آگ بجھائی	۱	۲	۳	۴
بجھوانا	ہم نے لڑکوں سے آگ بجھوادی	۱	۲	۳	۴
۱۰۔ بدلنا					
بدلنا	دوپٹے کا رنگ بدل گیا ہے	۱	۲	۳	۴

بدلانا	رنگ ساز نے دوپٹے کا رنگ بدلا ہے	۱	۲	۳	۴
بدلوانا	اس نے رنگ ساز سے اپنے دوپٹے کا رنگ بدلوالیا	۱	۲	۳	۴
۱۱۔ برفانا					
برفانا	پانی بہت جلد برفا گیا	۱	۲	۳	۴
برفانا	سردی نے پانی کو برفادیا	۱	۲	۳	۴
برفوانا	عورت نے فریزر سے پانی برفوادیا	۱	۲	۳	۴
۱۲۔ برقانا					
برقانا	تاریں برقا گئیں	۱	۲	۳	۴
برقانا	جنریٹر نے تاروں کو برقادیا	۱	۲	۳	۴
برقوانا	انجینیئر نے کاریگروں سے تاروں کو برقوادیا	۱	۲	۳	۴
۱۳۔ برَمانا					
برمانا	لکڑی کا تختہ برما گیا ہے	۱	۲	۳	۴
برمانا	ترکھان نے لکڑی کا تختہ برمادیا ہے	۱	۲	۳	۴
برموانا	آدمی نے ترکھان سے لکڑی کا تختہ برموالیا ہے	۱	۲	۳	۴
۱۴۔ بڑھنا					
بڑھنا	پٹرول کی قیمت پھر بڑھ گئی	۱	۲	۳	۴
بڑھانا	گورنمنٹ نے پٹرول کی قیمت پھر بڑھادی	۱	۲	۳	۴
بڑھوانا	وزیر نے سیکریٹری کے ذریعے پٹرول کی قیمت پھر بڑھوادی	۱	۲	۳	۴
۱۵۔ بُسنا					
بسنا	کھانا بُس گیا	۱	۲	۳	۴
بسانا	لڑکی نے کھانا بُسادیا	۱	۲	۳	۴
بسوانا	ماں نے لڑکی سے کھانا بُسوادیا	۱	۲	۳	۴
۱۶۔ بگڑنا					
بگڑنا	مریض کی صحت بگڑ گئی	۱	۲	۳	۴
بگاڑنا	بوڑھے نے سگرٹ نوشی سے اپنی صحت بگاڑلی	۱	۲	۳	۴
بگڑوانا	بوڑھے نے حکیم سے اپنی صحت اور بگڑوالی	۱	۲	۳	۴
۱۷۔ بگھارنا					
بگھارنا	دال بگھاری	۱	۲	۳	۴
بگھارنا	باورچی نے دال کو بگھارا	۱	۲	۳	۴

بگھروانا	اس نے باورچی سے دال کو بگھروایا	۱	۲	۳	۴
۱۸۔ بلونا					
بلونا	دودھ بلوگیا	۱	۲	۳	۴
بلونا	مکھن نکالنے کے لئے خاتون نے دودھ بلویا	۱	۲	۳	۴
بلوانا	خاتون نے اپنی بیٹی سے دودھ بلوایا	۱	۲	۳	۴
۱۹۔ بھُننا					
بھننا	چنے جلد بُھن جاتے ہیں	۱	۲	۳	۴
بھوننا	ہم پہلے گوشت کو بُھونتے ہیں	۱	۲	۳	۴
بھنوانا	گوشت باورچی سے بُھنوالو	۱	۲	۳	۴
۲۰۔ بھیگنا					
بھیگنا	گندم بارش میں بھیگ گئی	۱	۲	۳	۴
بھگونا	اس نے گندم کے دانوں کو پانی میں بگھویا	۱	۲	۳	۴
بھگوانا	اس نے گندم کے دانوں کو خادمہ سے پانی میں بگھوایا	۱	۲	۳	۴
۲۱۔ بھڑکنا					
بھڑکنا	اچانک آگ بھڑکی	۱	۲	۳	۴
بھڑکانا	لوگوں نے پٹرول سے آگ بھڑکادی	۱	۲	۳	۴
بھڑکوانا	سردار نے اپنے نوکروں سے آگ اور بھڑکوادی	۱	۲	۳	۴
۲۲۔ بیلنا					
بیلنا	روٹیاں بیل جاتی ہیں	۱	۲	۳	۴
بیلنا	میں نے روٹیاں بیلی	۱	۲	۳	۴
بیلوانا	میں اپنی دوست سے روٹیاں بیلوالیتی ہوں	۱	۲	۳	۴
۲۳۔ پتھرانا					
پتھرانا	مریض کی آنکھیں پتھرا گئیں	۱	۲	۳	۴
پتھرانا	مریض نے اپنی آنکھیں پتھرالیں	۱	۲	۳	۴
پتھروانا	مریض نے ڈاکٹر سے اپنی آنکھیں پتھروالیں	۱	۲	۳	۴
۲۴۔ پچکنا					
پچکنا	ٹین کا ڈبہ پچک گیا	۱	۲	۳	۴
پچکانا	بچے نے پلاسٹک کی بوتل پچکادی	۱	۲	۳	۴
پچکوانا	ہم پلاسٹک کی بوتلوں کو پچکوادیتے ہیں	۱	۲	۳	۴

۲۵۔ پسنا					
پسنا	ایک چکی میں چنے پس رہے تھے	۱	۲	۳	۴
پیسنا	وہ چنے پیس رہی ہے	۱	۲	۳	۴
پسانا/پسوانا	اس نے عورت سے چنے پسائے/پسوائے	۱	۲	۳	۴
۲۶۔ پکنا					
پکنا	چاول پک رہے ہیں	۱	۲	۳	۴
پکانا	میں نے چاول پکائے	۱	۲	۳	۴
پکوانا	آج ہم نے اپنی بھابھی سے چاول پکوائے	۱	۲	۳	۴
۲۷۔ پگھلنا					
پگھلنا	لوہا پگھل گیا	۱	۲	۳	۴
پگھلانا	کاریگر نے لوہا پگھلایا	۱	۲	۳	۴
پگھلوانا	انجینئیر لوہے کو کاریگروں سے بھٹی میں پگھلواتے ہیں	۱	۲	۳	۴
۲۸۔ پلپلانا					
پلپلانا	آم جلد پلپلا جاتا ہے	۱	۲	۳	۴
پلپلانا	کھانے سے پہلے آم کو ہم پلپلا لیتے ہیں	۱	۲	۳	۴
پلپلوانا	بچے آم کو بڑوں سے پلپلوا لیتے ہیں	۱	۲	۳	۴
۲۹۔ پلنا					
پلنا	تل ایک گھنٹے میں پل گئے	۱	۲	۳	۴
پیلنا	یہ لوگ تلوں کو کولھو میں پیلتے ہیں	۱	۲	۳	۴
پلوانا	زمیندار تلوں کو تیلی سے پلوالیتا ہے	۱	۲	۳	۴
۳۰۔ پنپنا					
پنپنا	پودے پنپ رہے ہیں	۱	۲	۳	۴
پنپانا	کسان پودوں کو پنپا رہا ہے	۱	۲	۳	۴
پنپوانا	کسان دوسروں سے پودوں کو پنپوا رہا ہے	۱	۲	۳	۴
۳۱۔ پھٹنا					
پھٹنا	زمین پھٹ گئی	۱	۲	۳	۴
پھاڑنا/پھوڑنا	دھماکے نے زمین پھاڑ دی	۱	۲	۳	۴
پھڑوانا	عزہ نے عائشہ سے زینب کی قمیض پھڑوادی	۱	۲	۳	۴

۳۲۔ پُھوٹنا					
پھوٹنا	نئی کونپلیں شجر میں پھوٹیں	۱	۲	۳	۴
پھٹانا	مالی نے نئی کونپلیں شجر میں پھٹادیں	۱	۲	۳	۴
پھٹوانا	مالک نے مالی سے نئی کونپلیں شجر میں پھٹوادیں	۱	۲	۳	۴
۳۳۔ پَھلنا					
پَھلنا	امرود کا درخت ہر سال پَھلتا ہے	۱	۲	۳	۴
پَھلانا	یہاں کا سازگار موسم اس درخت کو پھلا دیتا ہے	۱	۲	۳	۴
پَھلوانا	اچھی کھاد ان درختوں کو پھلوادے گی	۱	۲	۳	۴
۳۴۔ پُھلنا					
پُھلنا/پُھولنا	یہ پودا ہر موسم میں پھولتا ہے	۱	۲	۳	۴
پُھلانا	معتدل موسم اس پودے کو پُھلا دیتا ہے	۱	۲	۳	۴
پُھلوانا	ہم ان پودوں کو مالی سے پُھلواتے ہیں	۱	۲	۳	۴
۳۵۔ پُھولنا					
پُھولنا	میرا پیٹ اکثر پھول جاتا ہے	۱	۲	۳	۴
پُھلانا	چائے میرا پیٹ پھلا دیتی ہے	۱	۲	۳	۴
پُھلوانا	ڈاکٹر اس دوائی سے مریض کا پیٹ پھلواتے ہیں	۱	۲	۳	۴
۳۶۔ پھیلنا					
پھیلنا	دھاتیں پھیلتی ہیں	۱	۲	۳	۴
پھیلانا	حرارت دھاتوں کو پھیلا دیتی ہے	۱	۲	۳	۴
پھیلُوانا	پہلے دھاتوں کو زیادہ درجہ حرارت پر پھیلواتے ہیں	۱	۲	۳	۴
۳۷۔ تانا					
تانا	تیل جلد تا جاتا ہے	۱	۲	۳	۴
تانا	میں نے تیل کو تالیا ہے	۱	۲	۳	۴
توانا	ہم نے حلوہ باورچی سے توالیا	۱	۲	۳	۴
۳۸۔ تپنا					
تپنا	یہ برتن تپ گیا ہے	۱	۲	۳	۴
تاپنا	انھوں نے آگ پر ہاتھ تاپے	۱	۲	۳	۴
تپوانا	بچوں نے سالن باورچی سے تپوالیا	۱	۲	۳	۴

۳۹۔ ترشنا					
ترشنا	پتھر ترش گیا ہے	۱	۲	۳	۴
تراشنا	جوہری نے پتھر کو تراشا	۱	۲	۳	۴
ترشوانا	آدمی نے جوہری سے پتھر کو ترشوالیا	۱	۲	۳	۴
۴۰۔ تڑخنا					
تڑخنا	شیشہ تڑخ گیا	۱	۲	۳	۴
تڑخانا	بچی نے شیشہ تڑخادیا	۱	۲	۳	۴
تڑخوانا	بہن نے بھائی سے شیشہ تڑخوادیا	۱	۲	۳	۴
۴۱۔ تڑکنا					
تڑکنا	برتن تڑک گیا	۱	۲	۳	۴
تڑکانا	باورچی نے برتن تڑکادیا	۱	۲	۳	۴
تڑکوانا	مالک نے باورچی سے برتن تڑکوادیا	۱	۲	۳	۴
۴۲۔ تلنا					
تلنا	مچھلی تل گئی ہے	۱	۲	۳	۴
تلنا	دوستوں نے مچھلی تلی ہے	۱	۲	۳	۴
تلوانا	ہم نے دکاندار سے مچھلی تلوائی ہے	۱		۳	۴
۴۳۔ تَمَنّانا					
تَمَنّانا	بچے کے گال تمتمائے	۱	۲	۳	۴
تَمَنّانا	بچے نے اپنے گال تمتمائے	۱	۲	۳	۴
تَمَنّوانا	بچے نے اپنے گال تمتموائے	۱	۲	۳	۴
۴۴۔ تَنْنا					
تَنْنا	اس کا جسم تَن گیا	۱	۲	۳	۴
تَنّانا	اس نے اپنا جسم تنایا	۱	۲	۳	۴
تنوانا	اس نے اپنا جسم تنوایا	۱	۲	۳	۴
۴۵۔ تھَرْتھَرانا					
تھَرْتھَرانا	مریض کا جسم تھَرْتھَرایا	۱	۲	۳	۴
تھَرْتھَرانا	مریض نے اپنا جسم تھَرْتھَرایا	۱	۲	۳	۴
تھَرْتھَروانا	مریض نے اپنا جسم ڈاکٹر سے تھَرْتھَروایا	۱	۲	۳	۴

۴۶۔ تھُڑنا					
تھُڑنا	کھانا تھُڑ گیا	۱	۲	۳	۴
تھُڑانا	کچھ لوگوں نے کھانا تھڑایا	۱	۲	۳	۴
تھُڑوانا	میزبان نے مہمان سے کھانا تھڑوایا	۱	۲	۳	۴
۴۷۔ ٹوٹنا					
ٹوٹنا	گلاس ٹوٹ گیا	۱	۲	۳	۴
توڑنا	بچے نے گلاس توڑ دیا	۱	۲	۳	۴
تڑوانا/توڑانا	افسر نے پرانے برتن نوکروں سے تڑوادیے	۱	۳	۳	۴
۴۸۔ ٹھٹھرنا					
ٹھٹھرنا	پانی ٹھٹھر گیا ہے	۱	۲	۳	۴
ٹھٹھرانا	ٹھنڈی ہوا ہر چیز کو ٹھٹھرا رہی ہے	۱	۲	۳	۴
ٹھٹھروانا	وہ جسم کو ٹھنڈی ہوا سے ٹھٹھروا رہا ہے	۱	۲	۳	۴
۴۹۔ جاگنا					
جاگنا	لوگ جاگ رہے ہیں	۱	۲	۳	۴
جگانا	چوکیدار نے لوگوں کو جگایا	۱	۲	۳	۴
جگوانا	میں نے اسے چوکیدار سے جگوایا	۱	۲	۳	۴
۵۰۔ جَلنا					
جلنا	لکڑیاں جل رہی ہیں	۱	۲	۳	۴
جلانا	انھوں نے لکڑیاں جلادی ہیں	۱	۲	۳	۴
جلوانا	میجر صاحب نے ملازم سے لکڑیاں جلوائیں	۱	۲	۳	۴
۵۱۔ جمنا					
جمنا	شبنم کے قطرے شدید سردی میں جم جاتے ہیں	۱	۲	۳	۴
جمانا	شدید سردی نے شبنم کے قطرے بہت جلد جمادیئے	۱	۲	۳	۴
جموانا	ہم دکاندار سے فریزر میں دودھ جموا تے ہیں	۱	۲	۳	۴
۵۲۔ جُھلَسنا					
جھلسنا	آج میرا ہاتھ جھلس گیا	۱	۲	۳	۴
جھلسانا	دشمن نے قیدی کے دونوں ہاتھ جھلسادیئے	۱	۲	۳	۴
جھلسوانا	افسر نے اپنے بندوں سے چور کے ہاتھ جھلسوادیئے	۱	۲	۳	۴

۵۳۔ چانڈنا					
چنڈنا	لوہا چنڈ گیا ہے	۱	۲	۳	۴
چانڈنا	لوہار نے لوہا چانڈ دیا ہے	۱	۲	۳	۴
چنڈوانا	اس نے لوہار سے لوہا چنڈوالیا ہے	۱	۲	۳	۴
۵۴۔ چبُنا					
چبنا/چبانا	پتے چب گئے	۱	۲	۳	۴
چبانا	بھوکے آدمی نے پتے چبائے	۱	۲	۳	۴
چبوانا	میں نے ان سے پتے چبوائے	۱	۲	۳	۴
۵۵۔ چَٹَخُنا					
چٹخنا	اس آدمی کی ہڈیاں چٹخ گئی ہیں	۱	۲	۳	۴
چٹخانا	زیادہ وزن نے اس کی ہڈیاں چٹخادیں	۱	۲	۳	۴
چٹخوانا	مالک نے زیادہ وزن سے مزدور کی ہڈیاں چٹخوادیں	۱	۲	۳	۴
۵۶۔ چٹکُنا					
چٹکنا	شیشہ چٹک گیا	۱	۲	۳	۴
چٹکانا	بچے نے شیشہ چٹکا دیا	۱	۲	۳	۴
چٹکوانا	اس نے بچے سے شیشہ چٹکوا دیا	۱	۲	۳	۴
۵۷۔ چُرمرُنا					
چُرمرنا	شیشہ گرااور چرمرا گیا	۱	۲	۳	۴
چُرمرانا	لڑکی نے ساری چوڑیاں چرمرادیں	۱	۲	۳	۴
چُرمروانا	لڑکی نے چوڑیاں بچوں سے چرمروادیں	۱	۲	۳	۴
۵۸۔ چرنا					
چرنا	لکڑی چر گئی ہے	۱	۲	۳	۴
چیرنا	لکڑہارے نے لکڑی چیر دی	۱	۲	۳	۴
چروانا	ہم نے لکڑی ترکھان سے چروائی	۱	۲	۳	۴
۵۹۔ چمکنا					
چمکنا	اس کے جوتے چمک رہے تھے	۱	۲	۳	۴
چمکانا	اس نے پالش سے اپنے جوتے چمکائے	۱	۲	۳	۴
چمکوانا	اس نے اپنے جوتے جفت ساز سے چمکوائے	۱	۲	۳	۴

۶۰۔ چُورنا					
چورنا	روٹی چوری	۱	۲	۳	۴
چورنا	ماں نے چھوٹی بچی کے لئے روٹی چوری	۱	۲	۳	۴
چورانا	زینب نے اپنی روٹی امی سے چورائی	۱	۲	۳	۴
۶۱۔ چھدنا					
چھدنا	پائپ چھد گیا ہے	۱	۲	۳	۴
چھیدنا	کسی نے پائپ چھید دیا	۱	۲	۳	۴
چھدوانا	کچھ لوگ اپنے کان چھدواتے ہیں	۱	۲	۳	۴
۶۲۔ چھلنا					
چھلنا	آلو چھل گئے ہیں	۱	۲	۳	۴
چھیلنا	وہ باورچی خانے میں آلو چھیل رہی تھی	۱	۲	۳	۴
چھلوانا	باورچی نے ہم سے آلو چھلوائے تھے	۱	۲	۳	۴
۶۳۔ چَھنْنا					
چھننا	سارا آٹا چھن گیا ہے	۱	۲	۳	۴
چھاننا	عورت نے آٹا چھان لیا ہے	۱	۲	۳	۴
چھنوانا	عالیہ نے عورت سے آٹا چھنوالیا ہے	۱	۲	۳	۴
۶۴۔ چِیتْھنا					
چیتھنا	الائچی چیتھ گئی	۱	۲	۳	۴
چیتھنا	اس نے ایک الائچی چیتھی اور گرم پانی میں ڈال دی	۱	۲	۳	۴
چیتھوانا	آپ ایک الائچی کسی سے چیتھوالیں	۱	۲	۳	۴
۶۵۔ خَرادْنا					
خرادنا	دھات خرادی	۱	۲	۳	۴
خرادنا	کاریگر نے دھات کو مشین پر خرادا	۱	۲	۳	۴
خرادوانا	علی نے دھات کو کاریگر سے خرادوایا	۱	۲	۳	۴
۶۶۔ خَمْنا					
خمنا	دراز ہڈیاں اکثر خمتی ہیں	۱	۲	۳	۴
خمانا	استاد نے تار کو خمایا	۱	۲	۳	۴
خموانا	ہم نے سریا لوہار سے خموالیا	۱	۲	۳	۴

۶۷۔ دَغْنا					
دغنا	اس کی ساری ٹانگ دغ گئی تھی	۱	۲	۳	۴
داغنا	ظالم نے اس کا جسم لوہے سے داغا	۱	۲	۳	۴
دغوانا	بادشاہ نے غلاموں کے بازو دغوادیئے	۱	۲	۳	۴
۶۸۔ دُبْلانا					
دبلانا	وہ ان دنوں دبلا گئی ہے	۱	۲	۳	۴
دبلانا	یہ ورزش تمھیں دبلادے گی	۱	۲	۳	۴
دبلوانا	کوچ نے کھلاڑیوں کو ورزش سے دبلوایا	۱	۲	۳	۴
۶۹۔ دَلْنا					
دلنا	دانے دلے	۱	۲	۳	۴
دلنا	عورت نے دانے چکی میں دلے	۱	۲	۳	۴
دلوانا	ماں نے دانے ایک عورت سے دلوائے	۱	۲	۳	۴
۷۰۔ دہکنا					
دہکنا	کوئلے دہک گئے	۱	۲	۳	۴
دہکانا	مزدوروں نے کوئلے دہکائے	۱	۲	۳	۴
دہکوانا	ڈرائیور نے اپنے کنڈیکٹر سے کوئلے دہکوائے	۱	۲	۳	۴
۷۱۔ دھندلانا					
دھندلانا	گاڑی کا شیشہ دھندلا گیا	۱	۲	۳	۴
دھندلانا	ٹھنڈی ہوا نے گاڑی کا شیشہ دھندلادیا	۱	۲	۳	۴
دھندلوانا	ڈرائیور نے گاڑی کا شیشہ دھندلوادیا	۱	۲	۳	۴
۷۲۔ دھننا					
دھننا	روئی دھن گئی	۱	۲	۳	۴
دھننا	وہ روئی دھن رہی ہے	۱	۲	۳	۴
دھنوانا	میں نے روئی دھنیے سے دھنوالی	۱	۲	۳	۴
۷۳۔ ڈھینا					
ڈھینا	مکان ڈھ گیا	۱	۲	۳	۴
ڈھانا	گورنمنٹ نے پرانی عمارت ڈھادی	۱	۲	۳	۴
ڈھوانا	صنعتکار نے سارے مکان ڈھوادیئے	۱	۲	۳	۴

۷۴۔ ڈوبنا					
ڈوبنا	جہاز ڈوب گیا	۱	۲	۳	۴
ڈبونا	اُنھوں نے مخالف فوج کے جہاز سمندر میں ڈبو دیے	۱	۲	۳	۴
ڈبوانا	حاکم نے دغاباز کو سمندر میں ڈُبوادیا	۱	۲	۳	۴
۷۵۔ رنگنا					
رنگنا	پردے رنگ گئے	۱	۲	۳	۴
رنگنا	وہ پردے رنگتے تھے	۱	۲	۳	۴
رنگوانا/رنگانا	انھوں نے پردے رنگ ساز سے رنگوائے	۱	۲	۳	۴
۷۶۔ رُندنا					
رندنا	ایک بوڑھا گاڑی تلے رند گیا	۱	۲	۳	۴
روندنا	گاڑی نے ایک بوڑھے کو روند دیا	۱	۲	۳	۴
رندوانا	بادشاہ انھیں ہاتھی سے رندوادیتا	۱	۲	۳	۴
۷۷۔ سدھرنا					
سدھرنا	دُوسرے دن ذرا اس کی حالت سُدھری	۱	۲	۳	۴
سدھارنا	ڈاکٹر نے مریض کی حالت سدھارنے کی کوشش کی	۱	۲	۳	۴
سُدھروانا	رہنما نے معاشی ماہرین سے کرنسی کی قدر کو سدرھروایا	۱	۲	۳	۴
۷۸۔ سڑنا					
سڑنا	لاش سڑ گئی ہے	۱	۲	۳	۴
سڑانا	وہ کھاد بنانے کیلیئے مچھلی کو سڑاتے ہیں	۱	۲	۳	۴
سڑوانا	وہ کھاد بنانے کیلیئے مچھلی کو نوکروں سے سڑواتے ہیں	۱	۲	۳	۴
۷۹۔ سکڑنا					
سکڑنا	پارہ سردی میں سکڑتا ہے	۱	۲	۳	۴
سکڑانا/سکیڑنا	سردی پارے کو سکڑادیتی ہے	۱	۲	۳	۴
سکڑوانا	ہم نے درزی سے کپڑا پہلے سکڑوایا اور پھر کٹوایا	۱	۲	۳	۴
۸۰۔ سلگنا					
سلگنا	لکڑیاں ابھی تک سلگ رہی تھیں	۱	۲	۳	۴
سلگانا	وہ لکڑیاں سلگا رہا تھا	۱	۲	۳	۴
سلگوانا	اس نے پہلے لڑکوں سے لکڑیوں کو سُلگوایا	۱	۲	۳	۴

۸۱۔ سَنسَنانا					
سَنسَنانا	پانی سنسنانے لگا	۱	۲	۳	۴
سَنسَنانا	باورچی نے پہلے پانی کو سنسنایا	۱	۲	۳	۴
سَنسَنوانا	پہلے پانی کو سنسنوالو	۱	۲	۳	۴
۸۲۔ سوجھنا					
سوجھنا	اس کی آنکھیں سوجھی ہوئی تھیں	۱	۲	۳	۴
بجھانا	اس نے رو رو کے اپنی آنکھیں بجھالیں	۱	۲	۳	۴
سجھوانا	اس نے اپنا گھٹنا چوٹ سے سجھوالیا ہے	۱	۲	۳	۴
۸۳۔ سوکھنا					
سُوکھنا	تولیہ سوکھ گیا	۱	۲	۳	۴
سکھانا	میں نے تولیہ سکھالیا	۱	۲	۳	۴
سکھوانا	میں کپڑے دھوبی سے سکھواتا ہوں	۱	۲	۳	۴
۸۴۔ سنکنا					
سنکنا	روٹی سنک گئی ہے	۱	۲	۳	۴
سینکنا	وہ روٹی توے پر سینکتی ہے	۱	۲	۳	۴
سنکوانا	ہم روٹیاں توے پر سنکواتے ہیں	۱	۲	۳	۴
۸۵۔ سنولانا					
سنولانا	دھوپ میں اس کا رنگ سنولا گیا	۱	۲	۳	۴
سنولانا	اس نے دھوپ میں اپنا رنگ سنولالیا	۱	۲	۳	۴
سنولوانا	تم دھوپ سے اپنا رنگ سنولوالو	۱	۲	۳	۴
۸۶۔ قلمانا					
قلمانا	کئی مائعات جم کر قلما جاتے ہیں	۱	۲	۳	۴
قلمانا	سائنسدان مختلف معدنیات کو مختلف درجہ حرارت پر قلماتے ہیں	۱	۲	۳	۴
قلموانا	استاد نے ہم سے معدنیات قلموائیں	۱	۲	۳	۴
۸۷۔ کترنا					
کترنا	چھالیہ کتر گیا	۱	۲	۳	۴
کترانا	میں نے کپڑا کترا	۱	۲	۳	۴
کتروانا	مالک نے سارے خط قینچی سے کتروادیئے	۱	۲	۳	۴

۸۸۔ کٹنا					
کٹنا	درخت کٹ گئے ہیں	۱	۲	۳	۴
کاٹنا	میں نے پیاز کاٹ دیے ہیں	۱	۲	۳	۴
کٹوانا	بدعنوان افسر نے سارے درخت کٹوادیے	۱	۲	۳	۴
۸۹۔ کٹنا					
کٹنا	جڑی بوٹیاں کٹ گئیں	۱	۲	۳	۴
کوٹنا	حکیم نے جڑی بوٹیاں کوٹ دیں	۱	۲	۳	۴
کٹوانا	حکیم نے شاگردوں سے جڑی بوٹیاں کٹوالیں	۱	۲	۳	۴
۹۰۔ کچلنا					
کچلنا	بکری کار تلے کچل گئی	۱	۲	۳	۴
کچلنا	کار نے ایک بکری کو کچل دیا	۱	۲	۳	۴
کچلوانا	حاکم نے باغی کو ہاتھی کے پاوں تلے کچلوادیا	۱	۲	۳	۴
۹۱۔ کَڑوانا					
کَڑوانا	کھانا کڑوا گیا	۱	۲	۳	۴
کَڑوانا	باورچی نے کھانا کڑوادیا	۱	۲	۳	۴
کَڑواوانا	باورچی نے کھانا اپنے شاگردوں سے کڑواوایا	۱	۲	۳	۴
۹۲۔ کڑھنا					
کڑھنا	دودھ کڑھ گیا ہے	۱	۲	۳	۴
کاڑھنا	والدہ نے دودھ کاڑھا	۱	۲	۳	۴
کڑھوانا	میں نے دودھ عائشہ سے کڑھوایا	۱	۲	۳	۴
۹۳۔ کسنا					
کسنا	رسی کس گئی	۱	۲	۳	۴
کسنا	اس نے رسی کسی	۱	۲	۳	۴
کسوانا/کسانا	ہم نے ساری رسیاں کسوادی ہیں	۱	۲	۳	۴
۹۴۔ کملانا					
کملانا	سارے پھول کملا چکے تھے	۱	۲	۳	۴
کملانا	مالی نے سارے پھول کملادیئے	۱	۲	۳	۴
کملوانا	کسان نے پھول کملوادیئے	۱	۲	۳	۴

۹۵۔ کھچنا					
کھچنا	رسی کھچ گئی	۱	۲	۳	۴
کھینچنا	اس نے ڈوری کھینچی	۱	۲	۳	۴
کھچوانا	اس نے لڑکوں سے دونوں رسیوں کو کھچوالیا	۱	۲	۳	۴
۹۶۔ کِھلنا					
کھلنا	تمام پھول کھل گئے	۱	۲	۳	۴
کھلانا	مالی نے تمام پھول کھلا لیئے	۱	۲	۳	۴
کھلوانا	مالک نے مالی سے پھول کھلوائے	۱	۲	۳	۴
۹۷۔ کھوَلنا					
کھولنا	پانی کھول گیا	۱	۲	۳	۴
کھولانا	ہم نے پانی کھولایا	۱	۲	۳	۴
کھولوانا	پہلے پانی کو خوب کھلوالو	۱	۲	۳	۴
۹۸۔ گاہنا					
گاہنا	فصل گاہ گئی	۱	۲	۳	۴
گاہنا	کسان فصل گاہ رہا ہے	۱	۲	۳	۴
گاہوانا	زمیندار نے دوسروں سے فصل گاہوالی	۱	۲	۳	۴
۹۹۔ گرنا					
گرنا	کئی مکان گر گئے	۱	۲	۳	۴
گرانا	ہم نے پرانی عمارتیں گرادیں	۱	۲	۳	۴
گروانا	گورنمنٹ نے پرانی عمارتیں گروادیں	۱	۲	۳	۴
۱۰۰۔ گلنا					
گلنا	تمام پھل گل چکے تھے	۱	۲	۳	۴
گلانا	شدید موسم آموں کو گلادیں گے	۱	۲	۳	۴
گلوانا	انھوں نے آم ڈبوں میں گلوادیئے مگر تقسیم نہیں کیے	۱	۲	۳	۴
۱۰۱۔ گھٹنا					
گھٹنا	اس بار امید واروں کی تعداد گھٹی	۱	۲	۳	۴
گھٹانا	اس نے اپنا وزن گھٹالیا	۱	۲	۳	۴
گھٹوانا	میں نے اپنا وزن ورزش سے گھٹوایا	۱	۲	۳	۴

۱۰۲۔ گھٹنا					
گھُٹنا	چاول گھُٹ گئے ہیں	۱	۲	۳	۴
گھوٹنا	میں نے چاولوں کو خوب گھوٹا	۱	۲	۳	۴
گھوٹانا	میں نے چاولوں کو خوب گھوٹالیا ہے	۱	۲	۳	۴
۱۰۳۔ گھڑنا					
گھڑنا	زیور گھڑ گیا	۱	۲	۳	۴
گھڑنا	سنار نے زیور گھڑ دیا ہے	۱	۲	۳	۴
گھڑوانا	میری بہن نے سنار سے زیور گھڑوایا	۱	۲	۳	۴
۱۰۴۔ گِھسنا					
گِھسنا	یہ کپڑا گھس گیا ہے	۱	۲	۳	۴
گِھسانا	یہ مشین پتھر کو گھسا دیتی ہے	۱	۲	۳	۴
گھسوانا	معمار پتھروں کو مزدوروں سے گھسواتے ہیں	۱	۲	۳	۴
۱۰۵۔ گھلنا					
گھلنا	شکر پانی میں گھل گئی	۱	۲	۳	۴
گھولنا/گھلانا	آپ نمک کو پانی میں گھولالیں	۱	۲	۳	۴
گھلوانا	آپ نمک کو پانی میں گھلوالیں	۱	۲	۳	۴
۱۰۶۔ کھنگرانا					
کھنگرانا	اس کے بال کھنگرا گئے	۱	۲	۳	۴
کھنگرانا	میری دوست نے اپنے بال کھنگرا لیے	۱	۲	۳	۴
کھنگروانا	اس نے بال حجام سے کھنگروالیئے	۱	۲	۳	۴
۱۰۷۔ مرجھانا					
مرجھانا	یہ پھول گرم موسم میں مرجھا جاتے ہیں	۱	۲	۳	۴
مرجھانا	انھوں نے سارے پھول مرجھا دیئے	۱	۲	۳	۴
مرجھوانا	انھوں نے سارے پھول مرجھوا دیئے	۱	۲	۳	۴
۱۰۸۔ مرنا					
مرنا	دو آدمی حادثے میں مر گئے	۱	۲	۳	۴
مارنا	شیر نے دو آدمی مار دیئے	۱	۲	۳	۴
مروانا	ظالم حاکم نے کئی آدمیوں کو مروا دیا	۱	۲	۳	۴

۱۰۹۔ مڑنا					
مڑنا	تاریں نیچے کو مڑ گئی ہیں	۱	۲	۳	۴
موڑنا	میں نے تاریں نیچے کو موڑ دی ہیں	۱	۲	۳	۴
مڑوانا	مالک مکان نے ایک ملازم سے تاریں نیچے کو مڑوا دی ہیں	۱	۲	۳	۴
۱۱۰۔ مسلنا					
مسلنا	پھول مسل گئے	۱	۲	۳	۴
مسلنا	بچے نے پھول مسل دیئے	۱	۲	۳	۴
مسلوانا	اس نے سارے پھول بچوں سے مسلوا دیئے	۱	۲	۳	۴
۱۱۱۔ نِتھَرنا					
نتھرنا	پانی نتھر گیا ہے	۱	۲	۳	۴
نتھارنا	پینے سے پہلے ہم یہ پانی نتھارتے ہیں	۱	۲	۳	۴
نتھروانا	پینے سے پہلے ہم یہ پانی نتھروا لیتے ہیں	۱	۲	۳	۴
۱۱۲۔ نرمانا					
نرمانا	یہ پھل نرما گیا ہے	۱	۲	۳	۴
نرمانا	آپ آم کو نرما لیں	۱	۲	۳	۴
نرموانا	آپ آم کو مجھ سے نرموا لیں	۱	۲	۳	۴

آپ کے تعاون کا شکریہ

Appendix C

Acceptability Judgment Task (A Sample in English)

(Transitivity Status of COS Verbs)

Age: _____ Gender: _____

Education: _____ Mother Tongue: _____

Urdu Experience: _____

Instructions

In the following task, three forms of an Urdu verb have been given, and against each form, there is a sentence in which that form is used. You are requested to judge whether the individual verb form and its use sound good or not TO YOU. Please read each of the following entries and rate it according to the scale provided as follows:

Rating Scale

1. PERFECT: This verb form sounds perfect, and I would use it when needed.
2. OKAY: This verb form is not completely perfect, but I might use it when needed.
3. AWKWARD: This verb form sounds strange, and I doubt I would use it.
4. TERRIBLE: This verb form sounds terrible, and I would never use it.

In order to indicate your response, circle the number corresponding to the rating you want to give to the verb form. If you have any questions, please ask the experimenter. We are interested in your IMMEDIATE response to the verb form.

Verb	Sentence	Rating			
bʊjʰna 'burn'					
bʊjʰ	*ag bʊjʰ gəi* 'The fire was extinguished.'	1	2	3	4
bʊjʰa	*səbʰi=ne ag bʊjʰai* 'All (of us) extinguished the fire.'	1	2	3	4
bʊjʰva	*həm=ne ləṛkũ=se ag bʊjʰvai* 'We had the boys extinguish the fire.'	1	2	3	4

References

Abbi, A. (2001). *A manual of linguistic fieldwork and structures of Indian languages.* Lincom Europa.

Aarts, B. (2007). *Syntactic gradience*: *The nature of grammatical indeterminacy*. Oxford: Oxford University Press.

Ackerman, F., & Moore, J. (2001). *Proto-properties and grammatical encoding: A correspondence theory of argument selection*. Stanford, CA: CSLI Publications.

Adeeba, F., & Hussain, S. (2011). Experiences in building the Urdu WordNet. *Proceedings of the 9th Workshop on Asian Language Resources* (pp.31–35). Chiang Mai: Thailand.

Ahmed, T., & Hautli, A. (2011). A first approach towards an Urdu WordNet. *Linguistics and Literature Review*, 1 (1), 1–14.

Aissen, J. (2003). Differential object marking: Iconicity vs. economy. *Natural Language and Linguistic Theory*, 21, 435–483.

Aitchison, J. (1994). *Words in the mind*. Oxford: Blackwell.

Alexiadou, A. (2010). On the morpho-syntax of (anti-)causative verbs. In M. Rappaport- Hovav, E. Doron & I. Sichel (Eds.), *Syntax, lexical semantics and event structure*, (pp.177–203). Oxford: Oxford University Press.

Alexiadou, A., & Anagnostopoulou, E. (2004).Voice morphology in the causative-inchoative alternation: Evidence for a non-unified structural analysis of unaccusatives. In A. Alexiadou, E. Anagnostopoulou, & M. Everaert (Eds.), *The unaccusativity puzzle: Explorations of the syntax-lexicon interface* (pp.114–136). Oxford: Oxford University Press.

Alexiadou, A., Anagnostopoulou, E., & Schäfer, F. (2006).The properties of anticausatives crosslinguistically. In M. Frascarelli (Ed.), *Phases of interpretation* (pp.187–212). Berlin: Mouton de Gruyter.

Alexiadou, A., & F. Schäfer. (2006). Instrument subjects are agents or causers. *Proceedings of the 25th West Coast Conference on Formal Linguistics* (pp.40–48). Somerville, MA: Cascadilla Proceedings Project.

Alexiadou, A., Anagnostopoulou, E., & Schäfer, F. (2015). *External arguments in transitivity altnernations: a layering approach*. Oxford: Oxford University Press.

Al-jabr, A.F. (2006). Effect of syntactic complexity on translating from/into English/Arabic. *Babel*, 52(3), 203–221.

Allen, S.E.M. (2000). A discourse-pragmatic explanation for argument representation in child Inuktitut. *Linguistics*, 38 (3), 483–521.

Alsina, A. (1993). Predicate composition: A theory of syntactic function alternations (Doctoral dissertation). Stanford University, Stanford.

Andrews, R. (2003). *Research Questions*. London: Continuum.

Aronoff, M. (1976). *Word formation in generative grammar*. Cambridge, MA: MIT Press.

Aronoff, M. (1994). *Morphology by itself: Stems and inflectional classes*. Cambridge, MA/London: MIT Press.

Baker, M. C. (1988). *Incorporation: A theory of grammatical function changing*. Chicago, IL: University of Chicago Press.

Baker, M. (1992). *In other words: A coursebook on translation*. London: Routledge.

Balachandran, L. B. (1971). *A case grammar of Hindi with special reference to causative Sentences* (Doctoral dissertation). Cornell University, Ithaca.

Barsalou, L. (1999). Perceptual symbol systems. *Behavioral and Brain Sciences*, 22, 577–660.

Barsalou, L. (2003). Situated simulation in the human conceptual system. *Language and Cognitive Processes*, 18, 513–62.

Barsalou, L. (2005). Continuity of the conceptual system across species. *Trends in Cognitive Sciences*, 9, 309–11.

Barsalou, L. (2008). Grounded cognition. *Annual Review of Psychology*, 59, 617–45.

Bauer, L. (2001). *Morphological productivity*. Cambridge: Cambridge University Press.

Bauer, L. (2019). *Rethinking Morphology*. Edinburgh: Edinburgh University Press.

Bauer, L., Lieber, R., & Plag, I. (2013). *The Oxford reference guide to English morphology*. Oxford: Oxford University Press.

Beard, R. (1995). *Lexeme morpheme base morphology*. New York: SUNY Press.

Beavers, J. (2006). *Argument/oblique alternations and the structure of lexical meaning* (Doctoral dissertation). Stanford University, Stanford.

Beavers, J. (2010). Semantic specificity and the interaction of root and template meaning. Handout of talk at Verb Meaning Workshop, Barcelona.

Beavers, J., & Koontz-Garboden, A. (2012). Manner and result in the roots of verbal meaning. *Linguistic Inquiry*, 43 (3), 331–369.

Beavers, J., & Koontz-Garboden, A. (2017). The semantic contribution of idiosyncratic roots in ditransitive verbs. In A. Kaplan, A. Kaplan, M. K. McCarvel, & E. J. Rubin (Eds.), *Proceedings of the 34th West Coast Conference on Formal Linguistics, Cascadilla Proceedings Project* (pp.70–80). Somerville, MA: Cascadilla Proceedings Project.

Be´joint, H. (2006). Dictionaries. In E.K. Brown (Ed.), *Encyclopedia of language and linguistics* (2nded). vol.4, (pp.571–572). Oxford: Elsevier.

Bhatia, S. (2016). Causation in Hindi-Urdu: Care for your instruments and subjects. Retrieved from https://www.semanticscholar.org/paper/Causation-in-Hindi-Urdu%3A-Care-for-your-Instruments -Bhatia/6a600b79ac43933378a14ae0fb5872420ff57805

Bhatt, R., & Embick, D. (2004). Causative derivations in Hindi. Ms. University of Texas & University of Pennsylvania. Retrieved from https://pdfs.semanticscholar.org/3702/39505f5fda1ca11e3031b740afe92d778af9.pdf

Bhatt, R., & Embick, D. (2017). Causative derivations in Hindi. *Indian Linguistics*, 78(1–2): 93–151.

Bierwisch, M. (2006). Thematic roles – universal, particular, and idiosyncratic aspects. In: I. Bornkessel, M. Schlesewsky, B. Comrie, A. D. Friederici (Eds.), *Semantic role universals and argument linking* (pp.89–126). Berlin: De Gruyter Mouton.

Blake, B.J. (2001). *Case* (2nded.). Cambridge: Cambridge University Press.

Bogdan, R.C., & Biklen, S.K. (2007). *Qualitative research for education: An introduction to theories and methods* (5thed.). US: Pearson Education.

Bohnemeyer, J., Enfield, N., Essegbey, J., Ibarretxe, I., Kita, S., Lüpke, F., & Ameka, F. K. (2007). Principles of event representation in language: The case of motion events. *Language*, 83(3), 495–532.

Bohnemeyer, J., Enfield, N. J., Essegbey, J., & Kita, S. (2011).The macro-event property: The segmentation of causal chains. In J. Bohnemyer & E. Pederson (Eds.), *Event representation in Language and cognition* (pp.43–67). Cambridge: Cambridge University Press.

Borer, H. (2003). Exo-skeletal vs. endo-skeletal explanations: Syntactic projections and the lexicon. In J. Moore & M. Polinsky (Eds.), *The nature of explanation in linguistic*

theory (pp.31–67). Stanford CA: CSLI Publications.

Borer, H. (2005). *The normal course of events*. Oxford, UK: Oxford University Press.

Börjars, K. (2006). Description and theory. In B. Aarts & A. McMahon (Eds.), *The handdbook of English linguistics*, (pp.9–32). UK: Blackwell Publishing Ltd.

Botha, R. P. (1981). *The conduct of linguistic inquiry: a systematic introduction to the methodology of generative grammar.* New York: De Gruyter Mouton.

Bresnan, J. (2001). *Lexical-functional syntax.* Oxford: Blackwell.

Bresnan, J., & Nikitina, T. (2008). The gradience of the dative alternation. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.330.8273&rep=rep1&type=pdf

Brown, J. D., & Rodgers, T. (2002). *Doing applied linguistics research.* Oxford: Oxford University Press.

Browska, E. (2010). Naive v. expert intuitions: An empirical study of acceptability judgments. *The Linguistic Review*, 27, 1–23. doi 10.1515/tlir.2010.001.

Buchstaller, I., & Khattab, G. (2013). Population samples. In R. J. Podesva & D. Sharma (Eds.), *Research methods in linguistics* (pp.74–95). Cambridge: Cambridge University Press.

Butt, M. (1993). Object specificity and agreement in Hindi/Urdu. In *Papers from the 29th Regional Meeting of the Chicago Linguistic Society* (pp.80–103). Chicago: The Chicago Linguistic Society.

Butt, M. (1995). *The structure of complex predicates in Urdu*. Stanford, CA: CSLI Publications.

Butt, M. (2006). *Theories of case*. Cambridge: Cambridge University Press.

Butt, M., King, T.H., Nino, M.E., & Segond, F. (1999). *A grammar writer's cookbook.* Stanford: CSLI Publications.

Butt, M., & King, T. H. (2003). Case systems: Beyond structural distinctions. In E. Brandner &

H. Zinsmeister (Eds.), *New perspectives in case theory* (pp.49–84). Stanford, CA: CSLI Publications.

Butt, M., & King, T. H. (2005). The status of case. In V. Dayal & A. Mahajan (Eds.), *Clause structure in South Asian languages* (pp.153–198). Berlin: Springer.

Butt, M., & Ramchand, G. (2005). Complex aspectual structure in Hindi/Urdu. In N. Erteschik-Shir & T. Rapoport, (Eds.), *The syntax of aspect* (pp.117–153). Oxford: Oxford University Press.

Butt, M., & King, T.H. (2006). Restriction for morphological valency alternations: The Urdu causative. In M. Butt, D. Mary & K. Tracy (Eds.), *Intelligent linguistic architectures: Variations on themes by Ronald M. Kaplan* (pp.235–258). Bibliovault OAI Repository, the University of Chicago Press.

Chierchia, G. (2004). A semantics for Unaccusatives and its syntactic Consequences. In A. Artemis, E. Anagnostopoulou, & M. Everaert (Eds.), *The unaccusativity puzzle: Explorations of the syntax-lexicon interface* (pp.22–59*)*. Oxford/New York: Oxford University Press.

Chomsky, N. (1957). *Syntactic structures*. The Hague: Mouton.

Chomsky, N. (1965). *Aspects of the theory of syntax*. Cambridge, MA: MIT Press.

Chomsky, N. (1980). *Rules and representations*. Oxford: Basil Blackwell.

Chomsky, N. (1981). *Lectures on government and binding*. Dordrecht: Foris Publications.

Chomsky, N. (1995). *The minimalist program*. Cambridge, MA: MIT Press.

Chomsky, N. (2007). Biolinguistic explorations: Design, development, evolution. *International Journal of Philosophical Studies,* 15(1), 1–21.

Comrie, B. (1985). Causative verb formation and other verb-deriving morphology. In T. Shopen

(Ed.), *Language typology and syntactic description 3: grammatical categories and the lexicon* (pp.309–348). Cambridge: Cambridge University Press.

Copley, B., & Wolff, C. (2014).Theories of causation should inform linguistic theory and vice versa. In B. Copley & F. Martin (Eds.), *Causation in grammatical structures* (pp.11–57). Oxford: Oxford University Press.

Cornips, L., & Poletto, C. (2005). On standardising syntactic elicitation techniques (part 1). *Lingua*, 115, 939–957. doi:10.1016/j.lingua.2003.11.004.

Cowart, W. (1997). *Experimental syntax: Applying objective methods to sentence judgments*. Thousand Oaks: Sage.

Creswell, J. W. (2009). *Research design: qualitative, quantitative and mixed methods approaches*. Thousand Oaks, CA: Sage.

Croft, W. (1990). Possible verbs and the structure of events. In S. L. Tsohatzidis (ed.), *Meanings and prototypes: Studies in linguistic categorization* (pp.48–73). London: Routledge.

Croft, W. (1991). *Syntactic categories and grammatical relations*. Chicago, IL: University of Chicago Press.

Croft, W. (1998). Event structure in argument linking. In M. Butt & W. Geuder (Eds.), *The projection of arguments: Lexical and syntactic constraints* (pp.21–63). Stanford, CA: CSLI Publications.

Croft, W. (2012). *Verbs*. Oxford: Oxford University Press.

Cruse, D. A. (1973). Some thoughts on agentivity. *Journal of Linguistics*, 9, 11–23.

Cruse, D.A. (1986). *Lexical semantics.* Cambridge: Cambridge University Press.

Culbertson, J., & Gross, S. (2009). Are linguists better subjects? *British Society for the Philosophy of Science*, 60, 721–736.

Culicover, P.W., & Jackendoff, R. (2005). Simpler syntax. New York: Oxford University Press.

Dabrowska, E. (2010). Naive v. expert intuitions: An empirical study of acceptability judgments. *The Linguistic Review*, 27, 1–23. doi:10.1515/tlir.2010.001

Davis, A. R. (2001). *Linking by types in the hierarchical lexicon*. Stanford, CA: CSLI Publications.

Davis, A. R., & Koenig, J. P. (2000). Linking as constraints on word classes in a hierarchical lexicon. *Language*, 76, 56–91.

Davis, H., & Demirdache, H. (2000). On lexical verb meanings: evidence from Salish. In C. Tenny & J.Pustejovsky (Eds.), *Events as grammatical objects* (pp.97–142). Stanford, CA: CSLI Publications.

Devitt, M. (2006). Intuitions in linguistics. *British Society for the Philosophy of Science*, 57, 481–513.

Dixon, R.M.W. (1972). *The Dyirbal language of North Queensland*. Cambridge: Cambridge University Press.

Dixon, R.M.W. (1982). *Where have all the adjectives gone?: And other essays in semantics and syntax*. Berlin: Mouton.

Dixon, R.M.W. (2005). *A semantic approach to English grammar* (2nd ed.). Oxford/New York: Oxford University Press.

Dixon, R.M.W. (2006). Adjective classes in typological perspective. In R.M.W. Dixon & A.Y. Aikhenvald (Eds.), *Adjective classes: A cross-linguistic typology* (pp.1–49). Oxford: Oxford University Press.

Dixon, R.M.W. (2009). The semantics of clause linking in typological perspective. In R. M. W. Dixon & A. Y. Aikhenvald (Eds.), *The Semantics of clause Linking* (pp.2–55). Oxford/New York: Oxford University Press.

Dixon, R. M. W., & Aikhenvald, A. Y. (2002). *Word: A cross-linguistic typology*. Cambridge: Cambridge University Press.

Dixon, R.M.W., & Aikhenvald, A.Y. (Eds.) (2006). *Adjective classes: A cross-linguistic Typology*. Oxford: Oxford University Press.

Doering, M. (2015). Verb semantics as denoting change of state in the physical world (Master's dissertation). Michigan State University, USA.

Dornyei, Z. (2007). *Research methods in applied linguistics*. Oxford: Oxford University Press.

Dowty, D.R. (1979). *Word meaning and Montague grammar*. Dordrecht: D. Reidel Publishing.

Dowty, D.R. (1991).Thematic proto-roles and argument selection. *Language*, 67, 547–619.

Dowty, D.R. (2001).The semantic asymmetry of argument alternations (and why it matters). In G. van der Meer & A. G. B. ter Meulen (Eds.), *Making sense: Frome lexeme to discourse*, Groninger Arbeiten zur germanistischen Linguistik Nr. 44. Groningen: Center for Language and Cognition.

Edger, D. (2003). *Core Syntax*. Oxford: Oxford University Press.

Embick, D. (2004). Unaccusative syntax and verbal alternations. In A. Alexiadou, E. Anagnostopoulou & M. Everaert (Eds.), *The unaccusativity puzzle: explorations of the syntax-lexicon interface* (pp.137–158). Oxford: Oxford University Press.

Embick, D. (2009). Roots, states, stative passives. Handout of talk presented at Roots, Stuttgart.

Engelberg, S. (1994). Valency and aspectuality. In D. W. Halwachs & I. Stütz (Eds.), *Sprache, Sprechen, Handeln I* (pp.53–59). Tübingen: Niemeyer.

Engelberg, S. (2000). Verb meaning as event structure. *LACUS Forum*, 26, 257–68.

Engelberg, S. (2019). Lexical decomposition: Foundational issues. In K. von Heusinger, C. Maienborn, & P.Portner (Eds.), *Semantics – Foundations, history and methods* (pp.156–

181). Berlin/Boston: De Gruyter Mouton.

Evans, V. (2009). *How words mean: lexical concepts, cognitive models and meaning construction*. Oxford: Oxford University Press.

Evans, V. (2010). Figurative language understanding in LCCM Theory. *Cognitive Linguistics*, 21 (4), 601–662.

Evans, V. (2013). *Language and time: A cognitive linguistics perspective*. Cambridge: Cambridge University Press.

Evans, V. (2015).What's in a concept? Analog versus parametric concepts in LCCM theory. In E. Margolis & S. Laurence (Eds.), *The conceptual mind: New directions in the study of concepts* (pp.251–290). Cambridge, MA: MIT Press.

Everett, D. (2012). What does Pirahã grammar have to teach us about human language and the mind? Wiley Interdisciplinary Reviews. *Cognitive Science*, 3(6), 555–563.

Featherston, S. (2007). Data in generative grammar: the stick and the carrot. *Theoretical Linguistics*, 33, 269–318.

Fellbaum, C. (Ed.). (1998). *WordNet: An electronic lexical database*. Cambridge, MA: MIT Press.

Fellbaum, C. (2002). On the semantics of troponymy. In R. Green, C.A. Bean, &S.H. Myaeng (Eds.), *The semantics of relationships* (pp.23–34). Dordrecht: Springer.

Fernando, M. (2013). The causative and anti-causative alternation in *Kikongo* (*Kizombo*) (Doctoral dissertation). Stellenbosch University.

Fillmore, C.J. (1965). *Indirect object constructions in English and the ordering of transformations*. The Hague: De Gruyter Mouton.

Fillmore, C. J. (1968). The case for case. In E. Bach & R. T. Harms (Eds.), *Universals in*

linguistic theory (pp.1–88). New York: Holt, Rinehart, and Winston.

Fillmore, C. J. (1970). The grammar of *hitting* and *breaking*. In R. Jacobs & P. Rosenbaum (Eds.), *Readings in English transformational grammar* (pp.120–133). Waltham, MA: Ginn.

Fillmore, C. J. (1971). Some problems for case grammar. In R. J. O'Brien (Ed.), Report of the 22nd Annual Roundtable Meeting on Linguistics and Language Studies (pp.35–56). Washington, DC: Georgetown University Press.

Folli, R. (2003). Constructing telicity in English and Italian (Doctoral dissertation). University of Oxford.

Folli, R., & Harley, H. (2005). Flavors of v: consuming results in Italian and English. In P. Kempchinsky & R. Slabakova (Eds.), *Aspectual inquiries* (pp.95–120). Dordrecht: Springer.

Gay, L., Mills, G., & Airasian, P. (2012). *Educational research: Competencies for analysis and Applications* (10thed.). US: Pearson Education.

Gibson, E., & Fedorenko, E. (2010). Weak quantitative standards in linguistics research. *Trends in Cognitive Science*, 14, 233–234.

Gibson, E., & Fedorenko, E. (2013). The need for quantitative methods in syntax and semantics research. *Language and Cognitive Processes*, 28, 88–124.

Gilquin, G. (2010). Corpus, cognition and causative constructions. Amsterdam/Philadelphia: John Benjamins Publishing Company.

Gisborne, N. (2010). *The event structure of perception verbs.* Oxford: Oxford University Press.

Givón, T. (2002). *Bio-linguistics: the Santa Barbara lectures*. Amsterdam: Benjamins.

Goldberg, A. E. (1995). *Constructions: A construction grammar approach to argument*

structure. Chicago, IL: University of Chicago Press.

Goldberg, A. E. (2001). Patient arguments of causative verbs can be omitted: the role of information structure in argument distribution. *Language Sciences*, 23, 503–524.

Goldberg, A. E. (2010). Verbs, constructions, and semantic frames. In M. Rappaport-Hovav, E. Doron & I. Sichel, (Eds.), *Syntax, lexical semantics, and event structure* (pp.39–58). Oxford: Oxford University Press.

Green, C. (2017). *Patterns and development in the English clause system*. Singapore: Springer.

Greenfield, P. M., & Smith, J. (1976). *The structure of communication in early language development*. New York: Academic Press.

Grice, H. P. (1967). *Logic and conversation*. William James Lectures, Harvard.

Grice, H. P. (1989). *Studies in the way of words*. Cambridge, MA: Harvard University Press.

Grimshaw, J. (1979). Complement selection and the lexicon. *Linguistic Inquiry*, 10 (2), 279 – 326.

Grimshaw, J. (1982). On the lexical representation of Romance reflexive clitics. In J. Bresnan (Ed.), *The mental representation of grammatical relations* (pp.87–148). Cambridge, MA: MIT Press.

Grimshaw, J. (1990). *Argument structure*. Cambridge, MA: MIT Press.

Grimshaw, J. (1993). *Semantic structure and semantic content in lexical representation*. New Brunswick, NJ: Rutgers University.

Grimshaw, J. (2005). *Words and structure*. Stanford: CSLI Publications.

Grisot, C., & Moeschler, J. (2014). How do empirical methods interact with theoretical pragmatics? The conceptual and procedural contents of the English simple past and its translation into French. In. J. Romero-Trillo (Ed), *Yearbook of corpus linguistics and pragmatics* (pp.7–33). Switzerland: Springer International Publishing.

Gruber, J. S. (1976). *Lexical structures in syntax and semantics*. Amsterdam: North-Holland.

Hackle, M. (2013). The syntax-semantics interface. *Lingua*, 130, 66–87.

Hale, K.L., & Keyser, S.J. (1986). Some transitivity alternations in English. *Lexicon Project Working Papers 7*. Cambridge, MA: MIT Press.

Hale, K.L., & Keyser, S.J. (1993). On argument structure and the lexical expression of syntactic relations. In K. L. Hale & S. J. Keyser (Eds.), *The View from Building 20* (pp.53–109). Cambridge, MA: MIT Press.

Hale, K.L., & Keyser, S.J. (2002). Prolegomenon to a theory of argument structure. Cambridge, MA: MIT Press.

Hall, B. (1965). Subject and object in English (Doctoral dissertation). Cambridge, MA: MIT.

Halle, M., & Marantz, A. (1993). Distributed morphology and the pieces of inflection. In K. Hale & S.J. Keyser (Eds.), *The view from building*: *Essays in linguistics in honor of Sylvain Bromberger* (pp.111–176). Cambridge, MA: MIT Press.

Hancock, B.R., & Algozzine, B. (2006). *Doing case study research: A practical guide for beginning researchers*. New York: Teachers College Press.

Harrison, L. (2001). *Political research: An introduction.* New York: Routledge.

Haspelmath, M. (1993). More on the typology of inchoative/causative verb alternations. In B. Comrie & M. Polinsky (Eds.), *Causatives and transitivity* (pp.87–120). Amsterdam: John Benjamins.

Haspelmath, M. (2002). *Understanding morphology*. London: Arnold.

Haspelmath, M. (2008). Causatives and Anticausatives. Retrieved from https://www.eva.mpg. de/lingua/conference/08_springschool/pdf/course_materials/haspelmath_ Causatives.pdf

Haspelmath, M. (2016a).The serial verb construction: Comparative concept and cross-linguistic

generalizations. *Language and Linguistics*, 17(3), 291–319.

Haspelmath, M. (2016b).Universals of causative and anticausative verb formation and the spontaneity scale. *Lingua Posnaniensis*, 2, 33–63. doi:10.1515/linpo-2016-0009

Haspelmath, M., Calude, A., Spagnol, M., Narrog, H., & Bamyacı, E. (2014). Coding causal-noncausal verb alternations: A form-frequency correspondence explanation. *Journal of Linguistics*, 50(3), 587–625.

Hautli-Janisz, A. (2014). Urdu/Hindi motion verbs and their implementation in a lexical Resource (Doctoral dissertation). Universität Konstanz.

Hautli-Janisz, A. (2015). Urdu/Hindi complex predicates of motion and the manner/result complementarity. *JSAL*, 7, 39–58.

Hay, J., Kennedy, C., & Levin, B. (1999). Scalar structure underlies telicity in degree achievements. *SALT*, 9, 127–44.

Higginbotham, J. (1989). Elucidations of meaning. *Linguistics and Philosophy* 12, 465–517.

Higginbotham, J., Pianesi, F., & Varzi, A. C. (2000). *Speaking of events*. Oxford: Oxford University Press.

Himmelmann, N. P. (2012). Linguistic data types and the interface between language documentation and description. *Language Documentation & Conservation* 6. Retrieved from http://nflrc.hawaii.edu/ldc/?p=138

Hirose, T. (2003). *Origins of predicates*. New York/London: Routledge.

Hook, P. E. (1991). The emergence of perfective aspect in Indo-Aryan languages. In E. Traugott and B. Heine (Eds.), Approaches to Grammaticalization, (pp.59–89). Amsterdam: Benjamins.

Hout, A. van. (1996). *Event semantics of verb frame alternations: A case study of Dutch and its acquisition*. (Doctoral dissertation). Katholieke Universiteit Brabant, Tilburg.

Huang, C. (2011). Referential choice in Mandarin child language: A discourse-pragmatic perspective. *Journal of Pragmatics,* 43, 2057–2080.

Huang, C. (2012). Referential choice and informativeness in mother–child conversation: A focus on the mother. *Language Sciences*, 34, 319–338.

Huddleston, R. & Pullum, G.K. (2002). The Cambridge grammar of the English language. Cambridge: Cambridge University Press.

Jackendoff, R. (1972). *Semantic interpretation in generative grammar*. Cambridge, MA: MIT Press.

Jackendoff, R. (1983). *Semantics and Cognition*. Cambridge, MA: MIT Press.

Jackendoff, R. (1987). The status of thematic relations in linguistic theory. *Linguistic Inquiry,* 18, 369–411.

Jackendoff, R. (1990). *Semantic structures*. Cambridge, MA: MIT Press.

Jackendoff, R. (1992). Mme. Tussaud meets the binding theory. *Natural Language and Linguistic Theory*, 10, 1–31.

Jackendoff, R. (1996). Conceptual semantics and cognitive Linguistics. *Cognitive Linguistics*, 7, 93–129.

Jackendoff, R. (1997). *The Architecture of the language faculty*. Cambridge, MA: MIT Press.

Jackendoff, R. (2002). Foundations of language. New York : Oxford University Press.

Jackendoff, R. & Audring, J. (2018). Morphology and memory: Toward an integrated theory. *Topics in Cognitive Science*, 1–27. doi: 10.1111/tops.12334

Jackendoff, R. & Audring, J. (2020). *The texture of the lexicon: Relational morphology and the parallel architecture*. Oxford: Oxford University Press.

Jacobson, P. (2014). *Compositional semantics: An introduction to the syntax/semantics interface*.

Oxford: Oxford University Press.

Jespersen, O. (1961). A modem English grammar on historical principles (Vol.2). London: George Allen and Unwin.

Johnson, M. (1987). *The body in the mind: The bodily basis of meaning, imagination and reason*. Chicago: University of Chicago Press.

Johnson, M. (2007). *The meaning of the body: Aesthetics of human understanding*. Chicago: University of Chicago Press.

Johnson, K. (2008). An overview of lexical semantics. *Philosophy Compass,* 3(1), 119–134.

Johnson, K. (2008). *Quantitative methods in linguistics*. UK: Blackwell Publishing.

Kachru, Y. (1966). *An Introduction to Hindi syntax.* Urbana-Champaign: University of Illinois.

Kachru, Y. (1973).Causative sentences in Hindi revisited. In B. Kachru (Ed.), *Issues in Linguistics. Paper in Honour of Henry & Renee Kahane* (pp.377–393). Urbana: University of Illinois Press.

Kachru, Y. (1976). On the semantics of causative construction in Hindi-Urdu. In M. Shibatani (Ed.), *Syntax and semantics: The grammar of causative construction*, (pp.353–369). London: Academic Press.

Kachru, Y. (2006). *Hindi*. Amsterdam/Philadelphia: John Benjamins Publishing Company.

Keith, S., Lascarides, A. & Calder. J. (2006). *Introduction to cognition and communication.* Cambridge: The MIT Press.

Kemmerer, D. (2000). Grammatically relevant and grammatically irrelevant features of verb meaning can be independently impaired. *Aphasiology,* 14 (10), 997–1020. doi:10.1080 /02687030050156584

Kennedy, C., & Levin, B. (2008). Measure of change: The adjectival core of verbs of variable

telicity. In L. McNally & C. Kennedy (Eds.), Adjectives and adverbs in semantics and discourse (pp.156–182). Oxford: Oxford University Press.

Kepser, S., & Reis, M. (2005). Evidence in linguistics. In S. Kepser & M. Reis (Eds.), *Linguistic evidence: Empirical, theoretical, and computational perspectives* (pp.1–6). Berlin/New York: Mouton de Gruyter.

Keyser, S. J. & Postal, P. M. (1976). *Beginning English grammar*. New York: Harper and Row.

Khokholova, L.V. (1997). Infringement of morphological and syntactic operations' pairing in second causative formation. Paper presented at the XVIII South Asian Language Analysis Roundtable. New Delhi: JNU.

Kidwai, A. (2000). *XP-adjunction in universal grammar: Scrambling and binding in Hidi-Urdu*. New York: Oxford University Press.

Kistler, M. (2006). *Causation and laws of nature*. New York: Routledge.

Kistler, M. (2014). Analyzing causation in light of intuition, causal statements and science. In B. Copley & F. Martin (Eds.), *Causation in grammatical structures* (pp.76–99). Oxford: Oxford University Press.

Kittilä, S. (2002).*Transitivity: Towards a comprehensive typology*. Turku: Åbo Akademis Tryckeri.

Kleiman, A.B. (1971). Some aspects of the causative construction in Hindi. In *Papers on Hindi Syntax, vol. 1.2*, (pp.104–135). University of Illinois.

Koontz-Garboden, A. (2005). On the typology of state/change of state alternations. In G. Booij & J. van Marle (Eds.), *Yearbook of morphology 2005* (pp.83–117). Dordrecht: Springer.

Koontz-Garboden, A. (2007). States, changes of states, and the monotonicity hypothesis (Doctoral dissertation). Stanford, CA: Stanford University.

Koontz-Garboden, A. (2009). Anticausativization. *Nat Lang Linguistic Theory*, (27), 77–138.

Koontz-Garboden, A., & Beavers, J. (2017). Change of state verbs and the semantics of roots. In A. Kaplan, A. Kaplan, M. K. McCarvel, & E. J. Rubin (Eds.), *Proceedings of the 34th West Coast Conference on Formal Linguistics* (pp.347–354). Somerville, MA: Cascadilla Proceedings Project.

Kratzer, A. (1996). Severing the external argument from its verb. In J. Rooryck & L. Zaring (Eds.), *Phrase structure and the lexicon* (pp.109–137). Dordrecht: Kluwer.

Kratzer, A. (2004). Telicity and the meaning of objective case. In J. Guéron & J. Lecarme (Eds.), *The syntax of time* (pp.389–423). Cambridge, MA: MIT Press.

Krifka, M. (1989). Nominal reference, temporal constitution and quantification in event semantics. In R. Bartsch, J. van Benthem, & P. van Emde Boas (Eds.), *Semantics and contextual expression,* (pp.75–115). Dordrecht: Foris.

Krifka, M. (1992). Thematic relations as links between nominal reference and temporal constitution. In I. A. Sag & A. Szabolcsi (Eds), *Lexical matters* (pp.29–54). Stanford, CA: Stanford University.

Krifka, M. (2001). Lexical representations and the nature of the dative alternation. Handout, Conference on the Lexicon in Linguistic Theory, Düsseldorf.

Kumar, R. (2011). *Research methodology: A step by step guide for beginners*. London: Sage.

Kural, M. (2002). A four-way classification of monadic verbs. In A. Alexiadou (Ed.), *Theoretical approaches to Universals* (pp.139–63). Amsterdam: John Benjamins.

Labov, W. (1966). *The social stratification of English in New York City*. Philadelphia: University of Pennsylvania Press.

Labov, W. (1973). The boundaries of words and their meanings. In C.J. N. Bailey & R. W.

Shuy (Eds.), *New ways of analysing variation in English* (pp.340–373). Washington: Georgetown University Press.

Lakoff, G. (1965). On the nature of syntactic irregularity. (Doctoral dissertation). Indiana University, Bloomington. Published 1970 as Irregularity in syntax. New York: Holt, Rinehart, and Winston.

Lakoff, G. (1987). *Women, fire and dangerous things: What categories reveal about the mind*. Chicago: Chicago University Press.

Laks, L. (2014). Morpho-thematic mismatches in Hebrew: What happens when morphological and thematic criteria collide? *Lingua*, 138, 107–127.

Langacker, R.W. (1987). *Foundations of cognitive grammar (Vol.I): Theoretical prerequisites*. Stanford: Stanford University Press.

Langacker, R.W. (1991). *Foundations of cognitive grammar (Vol.I): Theoretical prerequisites*. Stanford: Stanford University Press.

Langacker, R.W. (2008). *Cognitive Grammar: A basic introduction*. Oxford: Oxford University Press.

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

Leedy, P.D., & Ormrod, J. E. (2013). *Practical research: Plan and design*. US: Pearson.

Lehmann, C. (2004). Data in linguistics. *The Linguistic Review*, 21. 175–210.

Levin, B. (1993). *English verb classes and alternations: A preliminary investigation*. Chicago, IL: University of Chicago Press.

Levin, B. (1999). Objecthood: An event structure perspective. *CLS 35, Part 1: Papers from the Main Session*, (pp.223–247). Chicago, IL: Chicago Linguistic Society.

Levin, B. (2004). Verbs and constructions: Where next? Retrieved from http://www.stanford.edu

/~bclevin/pubs.html.

Levin, B. (2006). Lexical semantics and rrgument realization: Where next? Retrieved from https://web.stanford.edu/~bclevin/dgfs06intro.pdf

Levin, B. (2009). Lexical semantics of verbs I & II. Retrieved from https://web.stanford.edu /~bclevin/lsa09intro-sr.pdf

Levin, B. (2015a). Event encoding in a crosslinguistic perspective I & II. Retrieved from http://web.stanford.edu/~bclevin/lsa15intro.pdf

Levin, B. (2015b).Semantics and pragmatics of argument alternation. *Annual Review Linguist,* 1, 63–83.

Levin, B. (2018). Argument structure. In M. Aronoff (Ed.), *Oxford bibliographies in Linguistics.* New York: Oxford University Press.

Levin, B., & Rappaport-Hovav M. (1991).Wiping the slate clean: A lexical semantic exploration. *Cognition* 41, 123–51.

Levin, B. & Rappaport-Hovav, M. (1994). A preliminary analysis of causative verbs in English. *Lingua*, 92, 35–77.

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

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

Levin, B., & Rappaport-Hovav, M. (1999). Two structures for compositionally derived events. *Proceedings of SALT,* 9, (pp.199–223. Ithaca, NY: Cornell Linguistics Circle Publications.

Levin, B., & Rappaport-Hovav, M. (2003). Roots and templates in the representation of verb

meaning. Handout, Department of Linguistics. Stanford, CA: Stanford University.

Levin, B., & Rappaport-Hovav, M. (2004). The semantic determinants of argument expression: A view from the English resultative construction. In J. Gu'eron & J. Lecarme (Eds.), *The syntax of time* (pp.477–494). Cambridge, MA: MIT Press.

Levin, B. & Rappaport-Hovav, M. (2005). *Argument realization*. New York: Cambridge University Press.

Levin, B. & Rappaport-Hovav, M. (2006). Constraints on the complexity of verb meaning and VP structure. In Gaërtner, H.M., Eckardt, R., Musan, R., & Stiebels, B. (Eds.), *Between 40 and 60 Puzzles for Krifka*. Retrieved from http://zas.gwz-berlin.de/fileadmin/material /40-60-puzzles-for-krifka/pdf/levin_and_rappaport.pdf.

Levin, B., & Rappaport-Hovav, M. (2011). Lexical conceptual structure. In C. Maienborn, K. von Heusinger, & P.H. Portner, (Eds.), *Semantics: An international handbook of natural language meaning I* (pp.418–438). Berlin: Mouton de Gruyter.

Levinson, L. (2007). *The roots of verbs* (Doctoral dissertation). NYU, New York.

Lieber, R. (1981). Morphological conversion within a restrictive theory of the lexicon. In M. Moortgat, H. van der Hulst, & T. Hoekstra (Eds.), *The Scope of lexical* rules (pp.161–200). Dordrecht: Foris.

Lieber, R. (2004). *Morphology and lexical semantics*. Cambridge: Cambridge University Press.

Lieber, R. (2009). *Introducing morphology*. New York: Cambridge University Press.

Litosseliti, L. (Ed.). (2010). *Research methods in linguistics*. London: Continuum.

Maienborn, C. (2011). Event semantics. In C. Maienborn, K.V. Heusinger, & P. Portner (Eds.), *Semantics: An international handbook of natural language meaning (Vol.1)* (pp.802–829). Berlin/Boston: Walter de Gruyter.

Maienborn, C. (2019). Events and states. In R. Truswell (Ed.), *The Oxford handbook of event structure*. Oxford: Oxford University Press. doi: 10.1093/oxfordhb /9780199685318. 013.6

Mansoor, S. (2005). *Language planning in higher education: A case study of Pakistan*. Karachi: Oxford University Press.

Marantz, A. P. (1984). On the nature of grammatical relations. Cambridge, MA: MIT Press.

Marantz, A. (2005). Generative linguistics within the cognitive neuroscience of language. *The Linguistic Review*, 22, 429–445.

Masica, C. (1976). *Defining a linguistic area: South Asia*. Chicago: The University of Chicago Press.

Masica, C. (1991). *The Indo-Aryan languages*. Cambridge: Cambridge University of Press.

McCawley, J. D. (1968). Lexical insertion in a transformational grammar without deep structure. *CLS 4*, (pp.71–80). Chicago: Chicago Linguistic Society.

McKoon, G., & Macfarland, T. (2000). Externally and internally caused change of state verbs. *Language*, 76, 833-858.

Meleis, A. (2012) Theoretical nursing development & progress (5th ed.). Wolters Kluwer Health/ Lippincott William & Wilkins: Philadelphia.

Michaelis, L. A., & Ruppenhofer, J. (2001). *Beyond alternations: A constructional model of the German applicative*. Stanford, CA: CSLI Publications.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Thousand Oaks, CA: Sage.

Miller, G. A., Beckwith, R., Fellbaum, C., Gross, D., & Miller, K. J. (1993). Five papers on WordNet. Retrieved from http://www.mit.edu/~6.863/spring2009/readings/5papers.pdf

Mohanan, T. (1993). Case alternation on objects in Hindi. *South Asian Language Review*, 3, 1–30.

Mohanan, T. (1994). *Argument structure in Hindi*. Stanford: CSLI Publications.

Montaut, A. (2004). *A grammar of Hindi*. München: Lincom Europa.

Mumford, S., & Anjum, R.L. (2011). *Getting causes from powers*. Oxford/New York: Oxford University Press.

Murphy, G. L. (2002). *The big book of concepts*. Cambridge, MA: MIT Press.

Murphy, L. (2007). Lexical semantics. Retrieved from https://www.llas.ac.uk/resources /gpg /2821.

Murphy, M. L. (2010). *Lexical meaning*. Cambridge, UK: Cambridge University Press.

Myers, M. D. (2009). *Qualitative research in business & management*. London: Sage.

Myers, J. (2009a). The design and analysis of small-scale syntactic judgment experiments. *Lingua*, 119, 425–44. doi:10.1016/j.lingua.2008.09.003

Myers, J. (2009b). Syntactic judgment experiments. *Language and Linguistics Compass*. 3(1), 406–423, doi:10.1111/j.1749-818x.2008.00113.x

Newmeyer, F. J. (1998). *Language form and language function*. Cambridge, MA: MIT Press.

Ng, H. T., Wang, B., & Chan, Y. S. (2003). Exploiting parallel texts for word sense disambiguation. In *Proceedings of the 41st Annual Meeting of the Association for Computational Linguistics*, (pp.455–462). Sapporo. Retrieved from https://pdfs. semanticscholar.org /8696/aa8b3eb9409ebb50c9d91d0a17b4aa9c1e17.pdf

Nida, E. A. (2001). *Contexts in translating*. Philadelphia: John Benjamins.

Onysko, A., & Michel, S. (2010). Introduction: Unravelling the cognitive in word formation. In A. Onysko & S, Michel (Eds.), *Cognitive perspectives on word formation* (pp.1–25).

Berlin /New York: Walter de Gruyter.

Onwuegbuzie, A. J., & Leech, N. L. (2005). 'On becoming a pragmatic researcher: Importance of combining quantitative and qualitative research methodologies'. *International Journal of Social Research Methodology*, 8 (5), 375–387.

Palys, T. (2008). Purposive sampling. In L. M. Given (Ed.), *The Sage encyclopedia of qualitative research methods, Vol.2*, (pp.697–698). Los Angeles: Sage.

Pawley, A. (2011). Event representation in serial verb constructions. In J. Bohnemyer & E. Pederson (Eds.), *Event representation in Language and cognition* (pp.13 –42). Cambridge: Cambridge University Press.

Perlmutter, D.M., &. Postal, P.M. (1984). The 1-advancement exclusiveness law. In D.M. Perlmutter & C. Rosen (Eds.), *Studies in relational grammar 2* (pp.81–125). Chicago, IL: University of Chicago Press.

Perry, F. L. Jr., (2005). *Research in applied linguistics: Becoming a discerning consumer*. London: Lawrence Erlbaum Associates Publishers.

Pesetsky, D. M. (1995). *Zero syntax*. Cambridge. MA: MIT Press.

Pinker, S. (1989). *Learnability and cognition: The acquisition of argument structure*. Cambridge, MA: MIT Press.

Piñón, C. (2001). A finer look at the causative-inchoative alternation. In R. Hastings, B. Jackson & Z. Zvolenszky (Eds.), *Proceedings of semantics and linguistic theory XI*. Ithaka, NY: CLC Publications, Cornell University.

Pustejovsky, J. (1991). The syntax of event structure. *Cognition*, 41, 47–81.

Pustejovsky, J. (1995). *The generative lexicon.* Cambridge, MA: MIT Press.

Pylkkänen, L. (2002). Introducing arguments (Doctoral dissertation). MIT.

Pylkkänen, L. (2008). Introducing arguments. Cambridge, MA: MIT Press.

Radden, G., Köpcke, K., Berg, T., & Siemund, P. (2007). The construction of meaning in language. In G. Radden, K. Köpcke, T. Berg, & P. Siemund (Eds.), *Aspects of meaning construction* (pp.1–15). Amsterdam/Philadelphia: John Benjamins Publishing Company.

Ramchand, G. C. (1997). *Aspect and predication*. Oxford: Clarendon Press.

Ramchand, G. C. (2008). *Verb meaning and the lexicon: A first-phase syntax*. Cambridge: Cambridge University Press.

Ramchand, G.C. (2011). Licensing of instrumental case in Hindi/Urdu causatives. Retrieved from https://septentrio.uit.no/index.php/nordlyd/article/view/2230/2076

Ramchand, G. C. (2014). Causal chains and instrumental case in Hindi/Urdu. In B. Copley & F. Martin (Eds.), *Causation in grammatical structures* (pp.245–278). Oxford: Oxford University Press.

Ramchand, G. C. (2019). Event structure and verbal decomposition. In R. Truswell (Ed.), *The Oxford handbook of event structure*. Oxford: Oxford University Press. Retrieved from https://www-oxfordhandbooks-com.

Ramchand, G. C., & Reiss, C. (2007). Introduction. In G.C. Ramchand & C. Reiss (Eds.), *The Oxford handbook of linguistic interfaces*, (pp.1–4). Oxford: Oxford University Press.

Rappaport-Hovav, M. (in press).Grammatically relevant ontological categories underlie manner/result complementarity. *Israel Association for Theoretical Linguistics (IATL) 32.* Cambridge, MA: MIT Working Papers in Linguistics.

Rappaport-Hovav, M. (2014a). Lexical content and context: the causative alternation in English revisited. *Lingua*, 141, 8–29.

Rappaport-Hovav, M. (2014b). Building scalar change. In A. Artemis, H. Borer, & F. Schäfer (Eds.), *The syntax of roots and the roots of syntax*, (pp.259–281). Oxford: Oxford

University Press.

Rappaport Hovav, M. & Levin, B. (2012). Lexicon uniformity and the causative alternation. In M. Everaert, M. Marelj, & T. Siloni (Eds.), *The theta system: Argument structure at the interface*, (pp. 150–176). Oxford: Oxford University Press.

Rappaport-Hovav, M., Doron, E., & Sichel, I. (Eds.). (2010). *Syntax, lexical semantics, and event structure*. Oxford: Oxford University Press.

Rappaport-Hovav, M., & Levin, B. (2010). Reflections on manner result complementarity. In M. Rappaport-Hovav, E. Doron & I. Sichel, (Eds.), Syntax, lexical semantics, and event structure (pp.21–38). Oxford: Oxford University Press

Rappaport-Hovav, M. (2008). Lexicalized meaning and the internal temporal structure of events. In S. D. Rothstein (Ed.), Theoretical and crosslinguistic approaches to the semantics of aspect (pp.13–42). Amsterdam/Philadelphia: John Benjamins Publishing Company.

Rappaport Hovav, M., & Levin, B. (2005). Change-of-state verbs: Implications for theories of argument projection. In: N. Erteschik-Shir & T. Rapoport (Eds.), *The syntax of aspect* (pp.274–286). Oxford: Oxford University Press.

Rappaport Hovav, M. & Levin, B. (2001). An event structure account of English resultatives. *Language*, 77: 766–797.

Rappaport- Hovav, M. & Levin, B. (1998a). Building verb meanings. In M. Butt & W. Geuder (Eds.), *The projection of arguments: Lexical and compositional factors*, (pp.97–134). Stanford, CA: CSLI Publications.

Rappaport- Hovav, M. & Levin, B. (1998b). Morphology and Lexical Semantics. In A. Spencer & A. Zwicky (Eds.), *Handbook of morphology* (pp.248–271). Oxford: Blackwell.

Rappaport-Hovav, M., & Levin, B. (1988). What to do with theta-roles. In W. Wilkins (Ed.),

Syntax and semantics 21: Thematic relations (pp.7–36). New York: Academic Press.

Raza, G. (2011). *Subcategorization acquisition and classes of predication in Urdu*. (Doctoral dissertation). Universität Konstanz.

Reinhart, T. (2000). The theta system: syntactic realization of verbal concepts. *OTS Working Papers, TL-00.002*, Utrecht University.

Reinhart, T. (2002). The theta system – an overview. *Theoretical Linguistics*, 28, 229–290.

Reinhart, T. (2016). The theta system. In M. Everaert, M. Marelj & E. Reuland (Eds.), *Concepts, Syntax, and Their Interface: The Theta System*. MIT Press.

Richa. (2008). *Unaccusativity, unergativity and the causative alternation in Hindi: A minimalist analysis* (Doctoral dissertation). Jawaharlal Nehru University.

Riemer, N. (2005). *The semantics of polysemy. Reading meaning in English and Warlpiri*. Berlin: Mouton

Rosen, S. T. (1996). Events and verb classification. *Linguistics*, 34, 191–223.

Rosen, S. T. (1999). The Syntactic representation of linguistic events. *GLOT International*, 4(2), 3–11.

Rothstein, S. (1979).The syntactic forms of predication (Doctoral dissertation).University of Oxford.

Rothstein, S. (2004). *Structuring events: A study in the semantics of lexical aspect.* Oxford: Blackwell.

Sadler, L., & Spencer, A. (2001). Syntax as an exponent of morphological features. In G. Booij & J. van Marle (Eds.), *Yearbook of morphology 2000* (pp.71–96). Dordrecht: Springer.

Saksena, A. (1980). The source of causative contrast. *Lingua*, 51, 125–136.

Saksena, A. (1982a). The basicness of transitivity. *Journal of Linguistics*, 18, 355–360.

Saksena, A. (1982b). Contact in causation. *Language*, 58 (4). 820–831. Linguistic Society of America.

Saksena, A. (1982c). Topics in the analysis of causatives with an account of Hindi paradigms. Berkeley/Los Angeles: University of California Press.

Sandra, P.M. (1995). *Schemas in problem solving*. Cambridge: Cambridge University Press.

Saraireh, M. A. T. (2001). Inconsistency in technical terminology: a problem for standardization in Arabic. *Babel*, 47(1), 10–21.

Saussure, F. de. (2011). *Course in general linguistics*. Translated by W. Baskin, & edited by P. Meisel, H. Saussy, & J. Rosen. New York: Columbia University Press.

Schäfer, F. (2008). *The syntax of (anti-)causatives: External arguments in change-of-state contexts. Amsterdam*: John Benjamins.

Schäfer, F. (2009). The causative alternation. *Language and Linguistics Compass*, 3/2, 641–681.

Schütze, C.T. (1996). *The empirical base of linguistics: Grammaticality judgments and linguistic methodology*. Chicago: University of Chicago Press.

Schütze , C.T., & Sprouse, J. (2013). Judgment data. In R.J. Podesva & D. Sharma (Eds.), *Research methods in linguistics* (pp.27–50). Cambridge, UK: Cambridge University Press

Schütze, H., & Pederson, J. O. (1995). Information retrieval based on word senses. In *Proceedings of the 4th Annual Symposium on Document Analysis and Information.* Retrieval (pp.161–175). Las Vegas: NV.

Serratrice, L., Sorace, A., & Paoli, S. (2004). Crosslinguistic influence at the syntax–pragmatics interface: Subjects and objects in English–Italian bilingual and monolingual acquisition. *Bilingualism: Language and Cognition*, 7 (3), 183–205.

Shibatani, M. (1976). The grammar of causative constructions: A conspectus. In M. Shibatani (Ed.), *Syntax and semantics: Vol. 6. The grammar of causative constructions* (pp.1–40). New York: Academic Press.

Shibatani, M. (2002). Introduction. In M. Shibatani (Ed.), *The grammar of causation and interpersonal manipulation* (pp.1–21). Amsterdam/Philadelphia: John Benjamins Publishing Company.

Smith, C. S. (1970). Jespersen's 'Move and Change' class and causative verbs in English. In M. *A.* Jazayery, E. C. Polomé & W. Winter (Eds.), *Linguistic and literary studies in honor of Archibald A. Hill, Vol.2: Descriptive Linguistics* (pp.101–109). The Hague: Mouton.

Song, J.J. (1996). *Causatives and causation: A universal–typological perspective*. New York: Longman.

Sperber, D., & Wilson, D. (1995). *Relevance: Communication and cognition* (2nded.). Oxford: Blackwell.

Sprouse, J., Shütze, C., & Almeida, D. (2012). Assessing the reliability of textbook data in syntax: Adger's Core Syntax. *Journal of Linguistics*, 48, 609–652.

Sprouse, J., Shütze, C., & Almeida, D. (2013). A comparison of informal and formal acceptability judgments using a random sample from Linguistic Inquiry 2001–2010. *Lingua*, 134, 219–248.

Sprouse, J., & Almeida, D. (2013). The empirical status of data in syntax: A reply to Gibson and Fedorenko. *Language and Cognitive Processes*, 28(3), 222–228. doi: 10.1080/01690965.2012.703782

Stainton, R. J. (2014). Philosophy of linguistics. Retrieved from www. oxfordhandbooks.com

Stowell, T. (1981). *Origins of phrase structure*. (Doctoral dissertation). Cambridge, MA: MIT.

Subbarao, K. V. (2012). *South Asian languages: A syntactic typology*. New York/New Delhi: Cambridge University Press.

Szymanek, B. (1988). *Categories and categorization in morphology*. Lublin: Catholic University Press.

Talmy, L. (2000). *Toward a cognitive semantics* (Vol. I). Cambridge, MA: MIT Press.

Talmy, L. (2007). Foreword. In M. Gonzalez-Marquez, I. Mittelberg, S. Coulson & N. J. Spivey (Eds.), *Methods in cognitive linguistics*. Amsterdam: John Benjamins Publishing Company.

Taylor, J.R. (1995). *Linguistic categorization*. Oxford/New York: Oxford University Press.

Tenny, C. (1994). Aspectual roles and the syntax-semantics interface. Dordrecht: Kluwer.

Tenny, C., & Pustejovsky, J. (2000). A history of events in linguistic theory. In C. Tenny & J. Pustejovsky (Eds.), *Events as grammatical objects* (pp.3–37). Stanford, CA: CSLI Publications.

Travis, L. (2000). Event structure in syntax. In C. Tenny & J. Pustejovsky (Eds.), *Events as grammatical objects* (pp.145–85). Stanford, CA: CSLI Publications.

Valsiner, J. (2017). *From methodology to methods in human psychology*. Switzerland: Springer.

Van Valin, R. D., Jr. (1990). Semantic parameters of split intransitivity. *Language*, 66, 221–60.

Van Valin, R. D., Jr. (1999). Generalized semantic roles and the syntax-semantics interface. In F. Corblin, C. Dobrovie-Sorin, & J.M. Marandin (Eds.), *Empirical issues in formal syntax and semantics 2* (pp.373–389). The Hague: Thesus.

Van Valin, R. D., Jr. (2005). *Exploring the syntax–semantics interface*. Cambridge: Cambridge University Press.

Van Valin, R.D., Jr., & LaPolla, R. J. (1997). *Syntax: structure, meaning and function.*

Cambridge: Cambridge University Press.

Wasow, T., & Arnold, J. (2005). Intuitions in linguistic argumentation. *Lingua*, 115, 1481–1496. Retrieved from http://web.stanford.edu/~wasow/Lingua_data.pdf

Wechsler, S. (2015).*Word meaning and syntax*. Oxford: Oxford University Press.

Wilks, Y. (1987). Primitives. In S. C. Shapiro (Ed.), *Encyclopedia of AI II* (pp.759–761). New York: Wiley.

Williams, E. (1980). Predication. *Linguistic Inquiry*, 11, 203–238.

Williams, E. (1981). Argument structure and morphology. *The Linguistic Review*, 1, 81–114.

Wilson, E. (2017). Relevance theory. In Y. Huang (Ed.), *The Oxford handbook of pragmatics*. Retrieved from https://www.oxfordhandbooks.com

Wilson, D. & Sperber, D. (2012). *Meaning and relevance*. Cambridge: Cambridge University Press.

Wojcik, R. H. (1973). The expression of causation in English clauses (Doctoral dissertation). The Ohio State University.

Wolff, P. (2007). Representing causation. *Journal of Experimental Psychology*, 136 (1), 82–111.

Wolff, P., & Song, G. (2003). Models of causation and the semantics of causal verbs. *Cognitive Psychology*, 47, 276–332.

Wright, S. K. 2001. Internally caused and externally caused change of state verbs (Doctoral dissertation. Northwestern University, Evanston, IL.

Wright, S.K., 2002. Transitivity and change of state verbs. *BLS*, 28, 339–350.

Wright, S.K., & Levin, B. (2000). Unspecified object contexts with activity and change of state verbs. Paper presented at the 74th Annual LSA Meeting, Chicago, IL.

Wunderlich, D. (1997). Cause and the structure of verbs. *Linguistic Inquiry* 28, 27–68.

Wunderlich, D. (2000). Predicate composition and argument extension as general options – A

study in the interface of semantic and conceptual structure. In B. Stiebels & D. Wunderlich (Eds.), *The lexicon in focus* (pp.247–270). Berlin: Akademie Verlag.

Wunderlich, D. (2006).What the theory of the lexicon is about. In D.Wunderlich (Ed.), *Advances in the theory of the lexicon* (pp.1–25). Berlin: Mouton de Gruyter.

Yin, R.K. (2003). *Case study research:design and methods*. California: Sage Publications, Inc.