



**Acquisition of Turkish by Heritage Speakers:  
A Processability Approach**

by

**Fatih Bayram**

**Thesis submitted in fulfilment of the requirements for  
the Degree of Doctor of Philosophy (Integrated)**

**School of Education, Communication, and Language Sciences**

**Faculty of Humanities and Social Sciences**

**29 April 2013**

## **Abstract**

This study presents the findings of cross-sectional psycholinguistic research investigating the first-language acquisition of Turkish among heritage speakers in Germany. Studies in heritage language acquisition in the last decades have provided increasing evidence that heritage speakers do not always converge on the grammars of native speakers, which is predominantly explained in relation to estimates of reduced input and output conditions. Nonetheless, Montrul (2010) underlines the fact that estimates of input cannot be used as measurements and addresses the need for a well-established theoretical framework that will account for the development of heritage speakers' linguistic system to explain why heritage speakers succeed - or fail - in language acquisition in the ways that they do. This study aims to fill this gap by looking at the phenomena from a developmental perspective within the formalisms of Processability Theory (Pienemann, 1998, 2005), a well-established cross-linguistic approach to acquisition based on the architecture of the human language processor, but which has not previously been applied to Turkish. This study investigated the grammatical competence of twenty-four young heritage speakers of Turkish in Germany by testing their online processing of various Turkish grammatical structures, focusing on passives and subject relative clauses. The results demonstrate that the language acquisition of Turkish heritage speakers is developmentally constrained by availability of processing mechanisms. The participants displayed a clear hierarchy in their development, with competence in the processing of basic grammatical structures that are canonically mapped, but with gaps in the processing of complex structures such as passives and subject relative clauses that are non-canonically mapped and involve long-distance dependencies. This study thus contributes important insights both to theoretical accounts of acquisition of Turkish, and to the wider study of heritage language acquisition.

*To my parents...*

## **Acknowledgements**

It would not have been possible to write this doctoral thesis without the help and support of many kind and wonderful people.

Firstly I would like to express my sincerest gratitude to my principal supervisor Professor Manfred Pienemann for his invaluable advice, encouragement and patience throughout the project. His wide knowledge and enthusiasm about Processability Theory and linguistics have been second to none and fundamental to the success of my project.

My sincerest thanks must also go to my second supervisor Dr. Clare Wright for her invaluable guidance, unwavering support and kind words. Her positivity and encouragement when I wanted to throw in the towel were very much appreciated.

I would like to acknowledge the staff, both professional and administrative, at Newcastle University ECLS, and the wider community of Newcastle University. I could not have chosen a better place to study. The Turkish Government also deserves a special mention for awarding me the scholarship, which provided me with the means to study in the United Kingdom.

Special mention goes to dedicated researchers working within the Processability Theory framework from all around the world for their valuable advice and insightful comments.

A very special thanks goes to my dear friend Hakan Kunduz for designing creative and lively drawings for the tasks I used in data collection.

Particular thanks must go to all of the children and their families for taking part in this study, and for the administrators of the school in Germany for their support.

My uncle, aunt and their family also deserve special thanks for hosting me in Germany whilst I collected my data, and providing me with contacts at the local school and in the Turkish community in Munich.

Last but not least I would like to thank my friends and family in Turkey, the UK and elsewhere for their unwavering support. To my mother and father for always lending me a comforting ear and my siblings for taking my mind off looming deadlines; I could not have done it without you. Thanks also to my fiancée for her continual moral support and special thanks to her family for hosting me near the end of the project. Finally to Mishka, the most special little cat I have ever known; you made me laugh so much and you will be missed.

Despite all the help I received in the research for this project, I take all responsibility for any errors or inaccuracies.

## TABLE OF CONTENTS

<b>Chapter 1. Introduction</b>	<b>1</b>
<b>Chapter 2. An Overview of Heritage Language Studies</b>	<b>8</b>
2.1 Definition of the Term	8
2.2 What is incomplete in heritage language grammars?	11
2.3 Key Theoretical Approaches to Acquisition of Heritage Languages	17
<b>Chapter 3. Turkish as a Heritage Language in Germany</b>	<b>26</b>
3.1 Turkish in Germany	26
3.2 Language Education of Turkish Immigrants	28
3.3 Linguistic Outcomes in Turkish as L1	33
<b>Chapter 4. Processability Theory</b>	<b>40</b>
4.1 Lexical Functional Grammar	50
4.2 Non-linearity in PT	54
4.2.1 The Unmarked Alignment Hypothesis	55
4.2.2 The Topic Hypothesis	56
4.2.3 The Lexical Mapping Hypothesis	58
<b>Chapter 5. A Processability Approach to Acquisition of Turkish Morphosyntactic System</b>	<b>63</b>
5.1 Lexical-Functional Grammar Analysis of Various Turkish Structures	64
5.1.1 Turkish Grammar in a Nutshell	64

5.1.2 Basic Syntactic Configuration	67
5.1.3 Pro-Drop feature of Turkish in LFG	71
5.1.4 Genitive-Possessive NP Construction	74
5.1.5 Verb Complements	76
5.1.6 Passive	79
5.1.7 Relative Clauses	89
5.2 Word order, Topic and Focus in Turkish	96
5.2.1 Subject as Topic in SOV	105
5.2.2 Non-core arguments as Topic	105
5.2.3 Non-subject Core Argument as TOPIC	107
<b>Chapter 6. Methodology</b>	<b>110</b>
6.1 Participants	112
6.2 Organisation of Data Collection	114
6.3 Communicative Tasks	115
6.3.1 Narrated Elicitation Task	117
6.3.2 Passive Elicitation Task	118
6.3.3 Relative Clause Elicitation Task	121
6.4 Acquisition criteria	123
6.4.1 Distributional Analysis	125
6.4.2 Implicational Scale	126
<b>Chapter 7. Results</b>	<b>132</b>
7.1 A processability perspective on the data	133

7.2 Category Procedure	141
7.3 Phrasal Procedure	143
7.4 Inter-phrasal Procedure	144
7.5 Subordinate Clause Procedure	147
7.6 Word order and Discourse Functions	151
<b>Chapter 8. Discussion</b>	<b>154</b>
<b>Chapter 9. Conclusion and Limitations</b>	<b>167</b>
9.1 Conclusion	167
9.2 Limitations	170
<b>Chapter 10. Appendices</b>	<b>172</b>
A. Participant information	172
B. Consent Letter	173
C. Pre-task interview guiding questions	174
D. Transcription Conventions	175
E. Frog Story Pictures	176
F. Passive Elicitation Task Pictures	179
G. Transcriptions (CD)	183
<b>References</b>	<b>184</b>

## List of Tables

<b>Table 2.1</b>	Educational responses to migration-related diversity in Germany	<b>29</b>
<b>Table 4.1</b>	Comparison of grammatical development in L1 and L2	<b>48</b>
<b>Table 4.2</b>	Processability hierarchy and implicational order of procedures	<b>61</b>
<b>Table 5.1</b>	Processing procedures in PT and Turkish structures	<b>64</b>
<b>Table 5.2</b>	Feature decomposition of argument functions	<b>80</b>
<b>Table 6.1</b>	Overview of the participants in this study	<b>112</b>
<b>Table 6.2</b>	Implicational scale	<b>127</b>
<b>Table 6.3</b>	Implicational scale for cross-sectional data	<b>128</b>
<b>Table 6.4</b>	Implicational scale for cross-sectional data with “error”	<b>129</b>
<b>Table 7.1</b>	Distributional analysis of morphosyntax for all participants in the order predicted by PT	<b>134</b>
<b>Table 7.2</b>	Application of emergence criterion to raw data	<b>136</b>
<b>Table 7.3</b>	Distributional analysis of discourse function mapping for all participants in the order predicted by PT	<b>138</b>
<b>Table 7.4</b>	Application of emergence criterion to word order and discourse functions	<b>138</b>
<b>Table 7.5</b>	Application of emergence criterion to overall distributional analysis	<b>140</b>

## List of Figures

<b>Figure 1.1</b>	Typical development of a heritage language (L1) in a majority language context.	<b>3</b>
<b>Figure 4.1</b>	The relationship between explanandum and explanans according to the Fundamental Difference Hypothesis	<b>41</b>
<b>Figure 4.2</b>	PT view on the explanatory devices in L1 and L2 acquisition	<b>41</b>
<b>Figure 4.3</b>	Levelt's language production model	<b>44</b>
<b>Figure 4.4</b>	Hypothesis space, development and variation	<b>46</b>
<b>Figure 4.5</b>	Structural developmental in generative entrenchment	<b>49</b>
<b>Figure 4.6</b>	f-structure for <i>Çocuk kurbagayı izliyor</i>	<b>52</b>
<b>Figure 4.7</b>	c-structure for <i>Çocuk kurbagayı izliyor</i>	<b>53</b>
<b>Figure 4.8</b>	c-structure rules for <i>Çocuk kurbagayı izliyor</i>	<b>53</b>
<b>Figure 4.9</b>	Three parallel structures of LFG for <i>Cocuk kurbagayı izliyor</i>	<b>54</b>
<b>Figure 4.10</b>	Linear mapping between the a-, f- and c- structure	<b>54</b>
<b>Figure 4.11</b>	One-to-one correspondences in Unmarked Alignment	<b>55</b>
<b>Figure 4.12</b>	Non-linear mapping by the addition of ADJ	<b>57</b>
<b>Figure 4.13</b>	The Topic Hypothesis	<b>58</b>
<b>Figure 4.14</b>	The Lexical Mapping Hypothesis	<b>60</b>
<b>Figure 5.1</b>	Information structure in Turkish	<b>98</b>
<b>Figure 6.1</b>	The first three pictures in <i>Frog Where are you?</i>	<b>118</b>
<b>Figure 6.2</b>	The fish film event	<b>119</b>
<b>Figure 6.3</b>	Passive elicitation task pictures	<b>120</b>

<b>Figure 6.4</b>	Relative clause elicitation task picture 1	<b>122</b>
<b>Figure 6.5</b>	Relative clause elicitation task picture 2	<b>123</b>
<b>Figure 6.6</b>	Accuracy and development	<b>124</b>
<b>Figure 7.1</b>	Average number of passive production	<b>145</b>
<b>Figure 7.2</b>	Average number of relative clause production	<b>150</b>

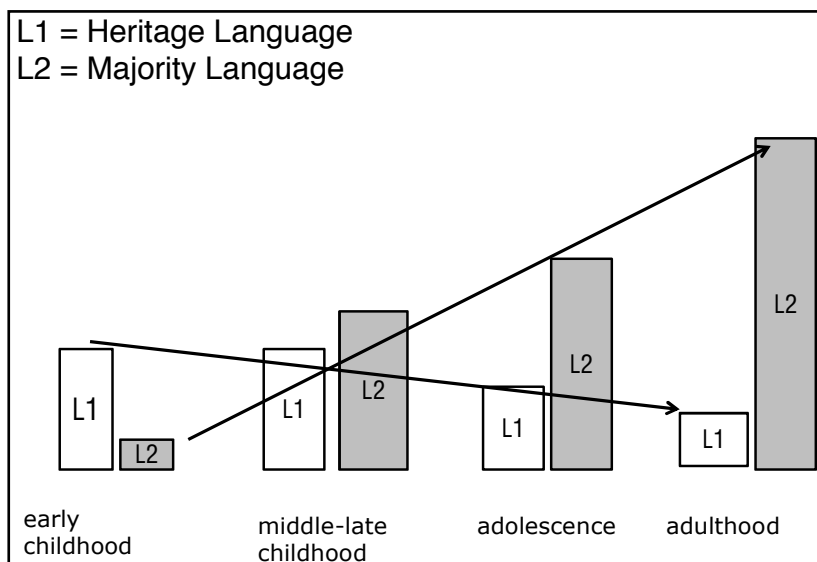
## Chapter 1. Introduction

This psycholinguistic study offers a novel, alternative approach to the identification of incomplete acquisition conceptualised as a final state phenomenon in recent literature on heritage language speakers (i.e., Montrul, 2008; Polinsky, 2006) by providing a more principled research program focusing on the process of language acquisition within the Processability Theory (Pienemann, 1998b; Pienemann et al., 2005) framework that has, I argue, the predictive power to capture accurately the process of language development leading to what is considered as incomplete. The main steps in this study are: (1) hypothesising a developmental hierarchy for the acquisition of Turkish morphosyntax, including complex grammatical structures that are hierarchically late acquired; (2) testing these hierarchical predictions against the data collected from Turkish heritage speakers via communicative tasks; and (3) in the light of the empirical findings discussing the developmental perspective on incompleteness against the existing views of incomplete language acquisition in heritage language studies. I am focusing on the linguistic complexity of grammatical structures from Processability Theory's (PT) developmental perspective by analysing them according to the hierarchy of procedural operations within Lexical-Functional Grammar's (LFG) (Bresnan, 2001) linguistic formalisms.

The motivation to take up this study in the first place comes from my personal experience with my immigrant relatives (second generation) and their children (third generation) in Germany; the history of Turks' migration to Germany will be discussed in Chapter 3. Every time they visited us in Turkey I was fascinated by their use of Turkish and German so interchangeably, especially that of children, but I was even more struck by the way they operated in Turkish as it sounded very different from how the rest of us spoke it in Turkey. Indeed, I found that there was a growing body of research proposing that both phonologically and structurally Turkish as spoken in the immigrant communities in Western Europe differed from Turkish as spoken in Turkey (for a detailed account on this issue, see Backus, 2004). This has motivated me to investigate the linguistic characteristics of Turkish spoken by my relatives and find out what factors cause such differences in the way they speak it.

However, the experience I have had with my relatives who live Germany is not a unique phenomenon. As a result of rapid globalisation in the last decades, the number of immigrant people around the world has dramatically increased and heritage language - also known as immigrant language or minority language - has become a new and interesting phenomenon in the study of human language. In a very broad sense, heritage language learners are the children of families who speak an ethnolinguistically minority language (Montrul, 2010a). Formally defined, heritage speakers are second or third generation bilingual immigrants who have spent their childhood hearing and speaking the parental language in the home environment, but become more dominant and fluent in the majority language of the wider community, often after formal schooling begins. (O'Grady & Lee, 2011; Polinsky & Kagan, 2007; Valdés, 1997, 2005). According to these definition, my relatives, their children and other children participating in this study are the heritage speakers of Turkish.

In the last decade, an increasing number of studies have aimed to understand and model the linguistic competence of heritage language speakers by comparing their linguistic competence with control groups of monolingual speakers as the standard norm. There are heritage speakers all around the world from varying language backgrounds, cultures, education and social status, and one of the commonly addressed phenomenon in the study of all those speakers is the mismatch between heritage speakers' linguistic competence in the home language and that of the age-matched native speakers of the same language who grow up in the home country. Therefore, the assumption is that this mismatch, which is regarded as incomplete acquisition when heritage speakers' linguistic competence is lower than the monolingual norm, results from the fact that input conditions are not optimal and heritage language is restricted to home environment with much less use in the wider society due to sociolinguistic factors (Montrul, 2012; Schlyter, 1993). Arguments of incompleteness have generally relied on these non-ideal input conditions disrupting the acquisition of heritage language. Figure 1 below demonstrates a typical path of heritage language and its relation to the majority language.



**Figure 1.1:** Typical development of a heritage language (L1) in a majority language context (adapted from Montrul, 2012)

Montrul (2010, 2012) notes that linguistic competence in the heritage language may range from native-like comprehension skills to intermediate and advanced production skills, depending on the language, the community, and a number of other sociolinguistic circumstances. In recent studies heritage speakers have been identified with several problems in their grammatical competence in production in the areas of lexicon, phonology, morphology, syntax, semantics and discourse-pragmatics when compared to monolingual native speaker competence (Benmamoun et al., 2010). This divergence of linguistic competence from native speakers has been addressed by the phenomenon of *incomplete acquisition* in heritage language presumably due to insufficient input and language use throughout childhood, a term that broadly refers to a deficient *outcome* of heritage language acquisition as compared to idealised monolingual norms for any given property in any given heritage language (Montrul, 2007; 2008; Pires & Rothman, 2009; Polinsky, 2006; Rothman, 2007). From an acquisition perspective, Montrul (2008, p.21) describes the characteristics of incomplete acquisition as “a mature linguistic state, the outcome of language acquisition that is not complete or [of] attrition in childhood. Incomplete acquisition occurs in childhood, when some specific properties of the language do not have a chance to reach age-appropriate levels of proficiency after intense exposure to the L2 begins.”

Many of these studies are descriptive in nature, and have been done within the generative framework as comparisons of heritage speakers with fully competent monolinguals born, raised and educated in the home country. These have shown potential changes between the linguistic abilities of heritage speakers (second/third generation), first generation immigrants, and monolinguals in the country of origin. This varying linguistic competence of heritage speakers is explained in relation to external factors such as estimates of reduced, restricted or insufficient input and output conditions (Montrul, 2011; Polinsky, 2011). It is generally concluded that heritage speakers seem to develop some core linguistic aspects of their family language though their grammatical system differs from that of monolinguals with a marked tendency to simplify complex structural patterns such as word order, passive and relative clauses where syntactic dependency and anaphoric binding are involved especially in pro-drop languages. However, these studies, which will be discussed in the next chapter, generally lack an explicitly justified theoretical framework which can account for the nature of incomplete first language acquisition in relation to input conditions. Moreover, studies of heritage language acquisition also lack a linguistic theory-driven criterion for what counts as fully acquired in monolingual context or non-acquired in defining incompleteness in heritage language acquisition.

In this vein, Pires and Rothman (2009) argue that there are relatively few formal linguistic studies investigating the grammatical competence of heritage language speakers, and that claims of “arrested” language development in heritage language acquisition do not portray the complex language acquisition process. Furthermore, Montrul (2011), underlining the fact that estimates of input quantity/quality and other sociolinguistic factors without empirical evidence, can not be used as measurements, addresses the need for a well-established theoretical framework that will account for the development of heritage speakers’ linguistic system which can explicitly depict why heritage speakers succeed or fail in language acquisition in the ways that they do.

There are a number of possible approaches that could be used to account for this variability in language development in bilingual contexts such as those heritage speakers are in. One possibility is to address developmental sequences as structure-building within a generative framework – one such

approach would be Vainikka and Young-Scholten's (2011) Organic Grammar model, which provides a syntax-driven account how stages of the syntactic tree are triggered from the input. An alternative is to look at the syntax-discourse/pragmatic interface - such as Tsimplici & Sorace's (2006) Interface Hypothesis, which claims that it is at the syntax-pragmatic interface domain where developmental instability is more pronounced since it represents a higher level of language use and pragmatic processing. However, I argue that these approaches are not sufficient to construct a formal set of hypotheses that are testable and provide predictive power to analyse the development of Turkish heritage speakers, as I will discuss in the following chapters. Moreover, research has found evidence against the Interface Vulnerability account, suggesting that the relationship between developmental instability and interface phenomena is not as straightforward as put forward in the Interface Hypothesis. For instance, Montrul and Ionin (2010) investigated heritage speakers of Spanish in the US in terms of the effect of transfer from English in the acquisition of the syntactic and semantic distribution of definite articles in Spanish. Results showed that for Spanish heritage speakers both syntax-semantics interface and syntax-discourse were affected by transfer. Similarly, Cazzoli-Goeta et al. (2010) and Cazzoli-Goeta and Young-Scholten (2011) investigated null subjects and quirky subjects and sentence-initial non-nominatives in Spanish respectively in contact with English (Spanish in the US and the UK) and provide evidenced that attrition occurs in the syntax proper as well as the syntax-discourse pragmatics interface; they argue that socio-economic factors should be taken into consideration while modelling attrition in language acquisition in contact situations.

To that end, the present study seeks to contribute to this emerging field of language acquisition studies by adopting the formal framework of Processability Theory (Pienemann 1998b, 2005), which I believe has insights and predictive power because of its specific processability claims based on the universal procedural mechanisms for the production of linguistic structures. In this study, the grammatical competence of twenty-four young Turkish heritage speakers in Germany is investigated from a developmental perspective within the formalisms of Processability Theory (Pienemann, 1998b, 2005), a well-established cross-linguistic approach to language acquisition based on the

general architecture of the human language processor, but which has not previously been applied to Turkish fully or to the study of heritage language acquisition. Instead of focusing on variational features in language development using socio-psychological factors (e.g., social distance from the target language group, intensity of contact, attitudes, motivation), which are problematic due to their descriptive nature, Processability Theory defines these developmental features according to their processing procedures (Pienemann, 1998b). The acquisition criterion operationalised in Processability Theory is based on the emergence of linguistic structures in the interlanguage, which requires systematic and productive use of any given structure (Pienemann, 1998b). This formal design of PT enables hypothesising the universal hierarchy of procedural skills used in the processing of language-specific grammatical structures, by which empirically testable predictions can be made for language development in any language (Pienemann, 1998a). PT is based on the claim that language development is constrained by the hierarchy of processing; that is, having acquired the procedural skills for processing structures at a lower level in the hierarchy is a prerequisite for the processing of the other structures at the next level.

In what follows, I begin with a general overview of heritage language studies to shed light on what is understood as incomplete as a linguistic outcomes of heritage language acquisition and theoretical weaknesses of the notion of incompleteness that exist in literature. In relation to this discussion on weaknesses, I point out two main issues within the current research program which are (a) theoretically unsupported reliance on restricted input conditions and (b) investigating incomplete acquisition as an outcome rather than a developmental process. Then, to provide reader with the research context, I turn in chapter 3 to explain the specific context of Turkish as a heritage language in Germany and present a descriptive review of selected linguistic studies. The discussions on incomplete heritage language acquisition and specific context of Turkish in Germany lead to chapter 4, where I present the novel developmental model by establishing the theoretical basis of this study with an account for Processability Theory that elaborates on the original version (Pienemann, 1998b) and its extended version (Pienemann et al., 2005). This will be followed in chapter 5 by a Lexical-Functional Grammar analysis of

various Turkish grammatical structures and their developmentally ordered processing mechanisms within Processability Theory. Chapter 6 presents the methodological aspects of this experimental study, which will be followed in Section 7 by the analysis of the findings. Section 8 offers a critical discussion on the results and what is considered as incomplete in the light of previous research and in this novel developmental approach. Chapter 9 is the final chapter with concluding remarks and limitations of the study addressing the possible agenda for future research.

Before moving to the next chapter, I wish to note the terms that will be used through the paper. Benmamoun et al. (2010) note that the terms “heritage language” and “heritage speaker” are new in the field of linguistic studies. These originated and are well-studied in Canada and the US; however, these terms are not explicitly understood or implemented in other parts of the world where such contexts are generally identified by the terms “minority language” or “immigrant language”. Such is the situation in Germany. Previous studies generally used the terms immigrant or minority language while referring to the heritage languages in Germany, which, as Gogolin (2005) highlights, until recently and contrary to the reality identified itself as a non-immigrant and thus monolingual country. As this paper discusses the linguistic characteristics of Turkish heritage speakers in Germany, the terms heritage, immigrant and minority will be used interchangeably while referring to the previous studies in particular that address the language of the Turkish-German community.

## **Chapter 2. An Overview of Heritage Language Studies**

Our knowledge about the precise nature of complete first language (henceforth L1) acquisition remains as yet *incomplete* (Davies, 2003). Similarly, the majority of empirical studies scrutinising first language acquisition by heritage speakers offer only partial answers to the identification of what is believed to be incomplete regarding the nature of their linguistic system (Benmamoun et al., 2010; Cabo & Rothman; 2012; Montrul, 2011). These answers are generally based on the representational characteristics of heritage speakers' linguistic systems through descriptive analyses without adequately addressing the underlying question of how to account for the process of language development leading to their unique linguistic competence. However, careful analyses of empirical data based on plausible linguistic theories and developmental psycholinguistics can shed light on the operational characteristics of heritage language acquisition in constructing ideas about heritage speakers' grammatical knowledge. In this chapter, I will present an overview of the literature on the linguistic competence of heritage speakers around the world. I will start with a clarification of the term's definition and next focus on heritage speakers' linguistic competence, and finally finish the chapter with a discussion on the main theoretical approaches that have been offered to account for incompleteness in the literature.

### **2.1 Definition of the Term**

Heritage language acquisition has emerged as a "new" field of study in the United States and Canada (Kondo-Brown, 2006; Montrul, 2008; Polinsky & Kagan, 2007) as a result of immigrant groups' desire to maintain their ethnolinguistic traditions (Fishman, 2001). Today the term heritage language generally refers to non-societal and non-majority languages spoken by a group of people regarded as linguistic minority (Valdés, 2005). Montrul (2011) defines heritage languages broadly as ethnic minority languages spoken around the world and divides them into two main categories: a) indigenous languages of a group of speakers who have always inhabited the region where the majority language is now spoken: for example, Welsh in Wales, Catalan in Catalonia, Quechua in Peru; and b) languages spoken by groups of immigrants who move to a host country where another majority language is spoken: Arabic and

Turkish in Germany and the Netherlands, speakers of Asian languages in the United Kingdom; Spanish, Korean, Japanese, Chinese, Arabic, Hindi, Russian, and many other immigrant groups in the United States and Canada (Montrul, 2011, p.156).

As a unique bilingual population, heritage language speakers have been increasingly scrutinised in various linguistic and second language education studies in recent years as this particular group of speakers present challenges to the theories of language acquisition with their unique language development process and have specific needs to maintain and develop their heritage language on top of what they have acquired in the home environment (Bylund & Diaz, 2012; Kondo-Brown, 2003, 2004, 2010). Studies have generally focused on language policy and identity (see the special section of *The Modern Language Journal*, 2005), education (Valdés et al., 2006), sociolinguistics (He, 2010), linguistics (Polinsky, 2004) and pedagogy (Polinsky & Kagan, 2007).

There are various definitions of heritage language speakers in the literature. Some definitions broadly refer to a heritage speaker as anybody with a distant cultural and affective connection to a language minority group even without any proficiency in the language. Fishman (2006), for example, broadly defines heritage speaker as child and adult members of a linguistic minority who grew up exposed to their home language and the majority language. Polinsky (2011) defines heritage speaker as a “bilingual who grew up hearing and possibly speaking an immigrant or minority language in the family or home and who has been dominant in the majority language of the wider community since early childhood” (p.306). Montrul (2010a) notes that heritage speakers are a special case of bilinguals whose home language is a minority language and who as children do not always get formal education in the heritage language, and grow up with a typically very high proficiency in the dominant language as opposed to varying proficiency and literacy in the heritage language. Other definitions address highly proficient users of the minority language. For instance, Valdés (2001, p.38) defines heritage speaker as “a student who is raised in a home where a non-English language is spoken, who speaks or merely understands the heritage language, and who is to some degree bilingual in English and the heritage language.” Similarlar, Van Deusen-Scholl (2003, p.221) portrays

heritage language learners as “a heterogeneous group ranging from fluent native speakers to non-speakers who may be generations removed, but who may feel culturally connected to a language.”

These definitions and many others in the literature vary significantly with respect to the necessary and sufficient conditions that bear on the label or classification of heritage language learners and speakers (Wiley, 2001). While all of them are valid for a particular community around the world and of significance for specific linguistic phenomena such as acquisition, language maintenance and teaching, Carreira (2004, p.1) argues that no single definition in the literature has the “explanatory adequacy” of embracing all and only such individuals that fall under the heading of heritage language learner or speaker, and argues that the diversity of individuals and populations makes it difficult to form a description that is both elastic and explicit.

For the purposes of this study, I adapt a combination of definitions proposed by Polinsky (2011), Valdés (2001) and Van Deusen-Scholl (2003) for the Turkish context in Munich/Germany, and define Turkish heritage speakers with an ethnolinguistic connection with Turkish with varying levels of linguistic competence compared to their monolingual peers and previous generations such as their parents and grandparents who were invited to Germany by the German government from the late 1950s till the mid-1970s to meet the fast growing economy’s need for unskilled labour. In my study, most of the parents came to Germany as a result of family reunion, which makes it problematic to call them as heritage speakers of Turkish since they had already acquired it in the monolingual environment of the home country before they migrated to Germany. The history of Turkish immigration to Germany and its linguistic outcomes through years as a result of social integration process will be discussed in the following chapter (Chapter 3). Because of the lack of clarity in the terminology (i.e., immigrant vs. minority vs. heritage), I discuss descriptive studies that refer to the patterns of Turkish within Germany in Chapter 3, rather than in this chapter, which consists of a more theoretically-motivated account of the heritage language acquisition in the wider research context.

Briefly, the first generation Turks in Germany were male adults who completed their education - generally at a low level - in Turkey and migrated to Germany

as workers (Backus, 2004; Beck, 1999). This was followed by family unification. Therefore, their children, the second generation, were either born in Germany or brought to Germany at a very young age into a family who knew little or no German. They were educated in Germany and had mother-tongue education besides mainstream German education (Gogolin, 2005; Hackett, 2011). The third generation, who are the participants in this study, were born in Germany into second generation Turkish families who generally knew German. This last generation is exposed to German at a very young age within the family and as a result of schooling which starts as early as age 3-4 with kindergarden (Pfaff, 2011). Thus, the definition both acknowledges the identity and family background of Turkish speakers, and addresses the heterogenous nature of linguistic outcomes of language acquisition in this particular context. In the last decades, this varying level of linguistic competence has attracted a number of theoretical and practical studies conducted in linguistics and language acquisition in general. In the next section, I will present an overview of these studies focusing on the incomplete linguistic competence of heritage speakers. This is followed by a critique of theoretical models of incomplete acquisition within the existing research program with a focus on their limitations, leading to a discussion of how the approach in this study aims to overcome these shortcomings.

## **2.2 What is incomplete in heritage language grammars?**

It is generally accepted that monolingual children acquiring their native language under normal circumstances commonly show little variation in the nature of their linguistic knowledge in adulthood (Scheele et al., 2010). Despite exposure to their mother tongue in early childhood like their monolingual peers, heritage language speakers differ from their monolingual peers in their linguistic proficiency both in production and comprehension due to a dramatic decrease in both exposure to and use of their heritage language as they grow older (e.g. Benmamoun et al. 2008; Montrul, 2002, 2004, 2006, 2010; O'Grady et al. 2001; Polinsky, 2006, 2008a, 2008b). Montrul (2008) also argues that the critical period has a strong impact on heritage language acquisition and proposes that incompleteness in the heritage language is less likely to occur if the exposure to the dominant language begins after the age of 9.

As a result of non-optimal input conditions within the home language environment in the early years of language acquisition (birth-4 years) and during the period of school years (4-13 years), which is still within the critical period, “many aspects of grammar may not reach full development and remain incompletely acquired” (Montrul, 2009, p.241). Therefore, heritage speakers are argued to have a non-native-like linguistic competence in early adulthood with better receptive skills than productive skills and gaps in linguistic knowledge (in gender agreement, verb paradigms, pronouns, case marking, word order, prepositions, etc.), and thus represent considerable variability in the range of their linguistic competence when they become adults (Kondo-Brown, 2004; Montrul, 2008, 2012; Montrul & Bowles, 2009; O’Grady et al., 2011; Polinsky, 2006; Song et al., 1997). In this line of thinking, incomplete acquisition is arguably seen as the product of a process, which is identified as “the non-target like ultimate attainment of adult early bilinguals (heritage speakers), which may be the result of many different situations leading to input reduction in childhood” (Montrul, 2009, p.241).

Within this perspective, studies have investigated the grammar of heritage speakers in terms of morphology, syntax and vocabulary. As for the richness of vocabulary, heritage speakers have been found to have gaps in their vocabulary and difficulty in retrieving words they do not use very frequently. For instance, Hulsen (2000) investigated Dutch heritage speakers in Australia in their lexical retrieval of nouns and found the accuracy level of lexical retrieval by second generation Dutch speakers was significantly lower than that of first generation speakers in Australia and the native-speaker control group in the Netherlands. Similarly, Polinsky (1997, 2007) found that vocabulary proficiency correlated positively with structural accuracy in Russian heritage speakers: Those speakers who knew more basic words from a list of 200 items exhibited better control of agreement, case markers, and subordination in spontaneous speech.

Commonly studied speakers of heritage languages in the USA (e.g., Spanish, Portuguese, Russian and Korean) have been shown to differ from their monolingual peers in their heritage language competence in various syntactic areas due to the flexible word order and grammatical relations established by nominal and verbal morphology. This also applies to Turkish grammar, and will

be explained below. In the nominal domain, heritage speakers seem to show high error rates in the production of gender, case marking and number. Monolingual Russian and Spanish-speaking children control gender marking by age 4 or earlier with almost 100 per cent accuracy (with the exception of most irregular, less frequent, and marked forms), while heritage speakers of these languages in the USA display very high error rates with gender marking (ranging from 5 per cent to 25 per cent accuracy) (Montrul et al., 2008 for Spanish; Polinsky, 2008a for Russian). In her study, Polinsky (2008a) reported that the neuter and feminine genders were the most affected areas in heritage speakers and found that higher-proficiency heritage speakers of Russian had a three-way gender system compared to lower-proficiency speakers who had a two-way distinction: only masculine and feminine, and no neuter. Similarly, Montrul et al. (2008) found that Spanish heritage speakers made gender errors where they simplified of marked forms and overextended the use of the default marking.

In nominal morphology, heritage language speakers also encounter problems with case marking. Polinsky (2006, 2008b) observed a reduced case system and problems with case in production among low-proficiency heritage Russian speakers in the USA, some of whom only used the structural cases, others only the most unmarked case. Russian is a language with six-way distinction in nouns: nominative, accusative, dative, instrumental, oblique, and genitive. Compared to six case markings in the native speaker Russian, in these studies heritage speakers have been shown to use only two cases: nominative and accusative, by replacing dative case by accusative, and accusative case by nominative.

Song et al. (1997) investigated case marking and word order among Korean heritage speakers in the USA and their monolingual peers. Although nominative and accusative case markers are typically dropped in Korean, monolingual children and adults gain full control of the case system, including the discourse-pragmatic conditions under which case markers can be dropped or retained. It was found that while 5- to 8-year-old monolingual Korean children were 86 per cent accurate at comprehending OVS sentences in Korean with nominative and accusative case markers, 5- to 8-year-old Korean heritage speakers performed

at less than 34 per cent accuracy. It was found that they tended to interpret OVS sentences as SOV sentences, ignoring the case markers. Montrul and Bowles (2009) also reported on Spanish heritage speakers who omitted case markers and retained a more fixed SVO nominative-accusative order. Similarly, Montrul (2010) found that Spanish heritage speakers accepted and comprehended SVO sentences accurately; however, they were much less accurate with sentences with preverbal objects. It was also found that heritage speakers were more likely to overuse overt subjects in topic shift and switch reference contexts where null subjects would be pragmatically more appropriate (for Spanish, Montrul, 2004; for Russian, Polinsky, 2006).

The relevance of case marking to incomplete heritage language grammars has also been studied in Arabic. Benmamoun et al. (2008) investigated productive control of agreement patterns in noun phrases in heritage speakers of Egyptian Arabic, heritage speakers of Palestinian-Jordanian Arabic, and native speakers of the two dialects in spontaneous oral production and elicited oral production tasks, and found that the native speakers performed at 99-100 per cent accuracy; however, the heritage speakers produced up to 30 per cent error rates with some words. Arabic has a complex system of gender and plural morphology where different endings mark masculine and feminine plural nouns and adjectives as well as nouns for people (human) and nouns for things (nonhuman). The most frequent ending is the feminine human ending *-aat*, and the masculine human ending is *-uun/-iin* (*mudarris* 'teacher' → *mudarrisun* 'teachers'), but there are numerous exceptions to these patterns. Arabic also has the broken plural: a productive process involving a change of root rather than simply suffixation as in *kitaab* 'book' becoming *kutub* 'books' and *film* 'film' becoming *-aflaam* 'films.' Benmamoun et al. (2008) found that the heritage speakers produced up to 30 per cent error rates with some words compared to the native speakers with 99-100 per cent accuracy. Heritage speakers also used non-adult patterns with broken plurals and made similar errors as monolingual Arabic children in the early stages of language development where they overgeneralised the use of the plural feminine suffix *-aat* to masculine contexts.

In addition to the problems in nominal morphology, heritage language speakers have also been found to experience problems with verbal morphology. Montrul (2002) and Polinsky (2007) investigated tense, aspect and modality in Spanish and Russian respectively and found that heritage speakers of these languages who lived in the US seemed to use regular forms of the present and past tenses correctly but confuse aspectual distinctions between perfective and imperfective forms. Montrul (2007) also reported a poor command of the subjunctive mood (in both present and past) by Spanish heritage speakers in production and in comprehension. Similarly, Brazilian Portuguese heritage speakers do not develop knowledge of inflected infinitives which is learned at school by exposure to written registers (Rothman, 2007).

It is also argued that as a result of incomplete mastery of inflectional morphology, heritage speakers exhibit problems in their syntactic knowledge too. For instance, Montrul (2010a) argues that a poor mastery of case-agreement morphology and a non-flexible word order in heritage language grammars result in problems with the basic clause structure and pronominal reference and lead to an overuse of null and overt subjects in null subject languages such as Spanish. In this line, Montrul (2010b) reports that Spanish heritage speakers accepted and comprehended SVO sentences more accurately than sentences with preverbal objects. Moreover, in Spanish, Russian and Arabic where null and overt pronouns are grammatical and discourse-pragmatic features such as topic continuation, topic shift, or switch reference govern the distribution of null and overt subjects, heritage speakers of these languages have been found to have a tendency to overuse overt subjects in topic shift and switch reference contexts where null subjects would be pragmatically more appropriate (Albirini et al, 2011; Montrul, 2004; Polinsky, 2007).

Studies have also shown that heritage language grammars show vulnerability in syntactic dependencies especially in complex structures such as relative clauses and passives. However, no previous study has paid specific attention to the acquisition of passive constructions by heritage language speakers. Only Polinsky (2009) reported that when compared to a monolingual Russian control group, English-dominant heritage speakers of Russian had problems with

passives and demonstrated significantly lower accuracy rates when they were asked to match active/passive constructions to pictures. But there is still an insufficient amount of empirical data for understanding the ability of heritage speakers to deal with structures that affect the arguments of a predicate. This study therefore set out to investigate passive constructions specifically to provide more insights into this much neglected area of heritage language grammars.

With respect to long-distance dependencies, various studies have found problems in relativisation and pronominal reference within and beyond the sentence such as reflexive pronouns (anaphors like English *himself*). Kim et al. (2009) looked at long-distance preferences among adult Korean heritage speakers. In Korean, there are three reflexives: (1) *caki*, which is subject oriented and prefers long-distance antecedents beyond the clause; (2) *casin*, which can take local or long-distance antecedents; and (3) *caki-casin*, which requires a local antecedent within the clause. Kim et al. (2009) found that Korean heritage speakers' interpretation of long-distance relations differed significantly from that of monolingual Korean speakers. Heritage speakers preferred local binding for *caki* and treated *casin* and *caki-casin* indistinguishably, as if they had a two-anaphor system.

Similarly, relative clauses and filler-gap dependencies (O'Grady et al., 2001; Polinsky, 2011) were investigated in Korean and Russian. For instance, Polinsky (2008c, 2011) investigated Russian heritage speakers' comprehension of subject and object relative clauses. O'Grady et al. (2001) looked at the acquisition of subject and object relative clauses by heritage and non-heritage learners. Lee-Ellis (2011) studied the factors effecting the relative clause production among Korean heritage speakers (e.g., gap position, animacy, and topicality). In all these studies, both Russian and Korean heritage speakers performed significantly better with subject relative clauses than object relative clauses. Thus, in relativisation, there is an advantage for subject relative clauses as opposed to non-subject relative clauses in heritage language grammars, as in many languages of the world (Montrul, 2011).

This generalised subject relative clause preference is arguably connected to cross-linguistic generalisation of relative clause formation order captured in the

noun phrase accessibility hierarchy by Keenan and Comrie (1977), (i.e., subject is the highest in the hierarchy, thus is easier to access and relativise than other grammatical functions lower in the hierarchy). Numerous acquisition studies have provided evidence supporting the development of relative clauses in accordance with the accessibility hierarchy (e.g., Doughty, 1991; Eckman et al., 1988; Gass, 1979). In heritage language acquisition, however, studies have been concerned with the subject relative clause preference over the object relative clause while lacking possible explanations for the mechanisms underpinning the acquisition of relative clauses by heritage speakers in more theoretical and empirical detail. Therefore, rather than looking at the preference between the two types of relative clauses, this study investigates whether the relative clause formation rule of procedural mechanisms in Turkish has been acquired or not based on the data eliciting relativisation of subject function. Since Turkish allows both subject and non-subject (i.e., Object) grammatical functions to be relativised (Kornfilt, 1997; Slobin, 1986), the subject relative clause is specifically chosen following the predictions outlined in the noun phrase accessibility hierarchy (Keenan & Comrie, 1977) and assuming that if heritage speakers of Turkish have acquired the rule of relativisation at all, they should be able to relativise the subject function before any other functions in the accessibility hierarchy.

### **2.3 Key Theoretical Approaches to Acquisition of Heritage Languages**

As discussed above, in the last two decades, the number of studies scrutinising the linguistic competence of heritage speakers around the world has increased rapidly. Although these studies make assumptions according to the data gathered through various linguistic experiments, the claims generally concern the patterns of incomplete linguistic proficiency on the basis of grammatical rule mastery according to a monolingual level as observed both in comprehension and production. However, they do not necessarily refer to a theoretical framework to account for the relationship between the mastery of a rule and the acquisition of the underlying mental mechanisms for that rule leading to varying degrees of linguistic competence. According to Albirini et al. (2011), heritage speakers do not fit within the traditional L1-versus-second-language (L2) dichotomy either since they are exposed to their home language as L1 in early

childhood while this exposure to L1 gets interrupted and limited in its scope and domain, and they become bilinguals when they start school in the majority language at around ages 3-4 onwards.

For instance, Montrul (2008, 2010), referring in part to a formal generative framework, relates this linguistic variability in the competence of heritage speakers to the “hybrid” nature of the heritage language acquisition which combines features of child L1 (guided by UG) and adult L2 acquisition (no access to UG), but goes on to propose that the outcome may be due to a variable amount of input and language use triggered by socio-affective factors such as motivation, identity, the prestige of home language within the larger society, availability of education in the home language, availability of L1 community to use the language, and peer pressure. While acknowledging that the effect of such factors is not fully understood on the linguistic outcome of heritage language contexts, Montrul (2008, p.126) develops “The Weaker Language as L1 Hypothesis” which predicts that the development of the weaker language in bilinguals may lag behind due to insufficient exposure to input and use; however, it is acquired “as a first language, through the same cognitive and linguistic means used to acquire the stronger language available in early childhood.” In Montrul’s hypothesis, a linguistic feature-based proposal is offered to account for the areas of grammar that are likely to be affected. These are uninterpretable formal features at the morphology-syntax interface (an internal interface) as well as the syntax-discourse interface (an external interface), as is the case in L1 attrition and L2 fossilisation. This hypothesis is offered as a response to Schlyter’s (1993) “Weaker Language as L2 Hypothesis”, according to which the weaker language acquired by early bilinguals (e.g., heritage speakers) develops as would an L2 in contexts of late acquisition. However, Montrul’s proposal goes beyond feature-based accounts by also referring to Ullman’s (2001) Declarative/Procedural Model, which, broadly speaking, places grammatical knowledge in procedural memory. Montrul (2008), then, predicts that heritage speakers acquire the knowledge of core phonology and morphosyntax (which emerges early in childhood before the age of 5) through procedural-based access to UG while context-dependent features of language, acquired procedurally after the age of 5 by monolingual

children, and reinforced through reading and schooling may be missed or get incompletely acquired as a result of insufficient input received in late childhood.

In a similar vein, by addressing Spanish heritage speakers from an assimilationist community<sup>1</sup> perspective, Bolger and Zapata (2011) argue that the most affected level of language seems to be the syntactic structures in the semantic/pragmatic domain. Bolger and Zapata (2011) also refer to Ullman's (2001) Declarative/Procedural Model, by proposing that lexical knowledge is more vulnerable in that it is stored in declarative memory, and making it more susceptible to the relative frequencies of its overall membership. Thus, according to Bolger and Zapata (2011), in the case of inhibition of L1 acquisition in early years of development, various necessary syntactic structures may have not been in place before procedural memory starts to mature for more efficient processing, and consequently, declining plasticity.

The weaker language as L1 account (Bolger & Zapata, 2011; Montrul, 2008) views the variability in the linguistic outcomes of heritage speakers from a quantitative perspective based on language use. The overall aim is to provide an explanation of the nature of linguistic variability for late acquired grammatical features among heritage speakers by addressing the source of linguistic knowledge from a descriptive perspective. However, there remains the question of how different types of grammatical information interact with each other for core or late acquired grammatical structures, and how they are operationalised in the cognitive system of heritage speakers in a way that may lead to either complete or incomplete acquisition throughout their language development process.

Following the arguments on socio-affective factors in previous heritage language studies, He (2010) also proposes that heritage language development is affected by heritage speakers' multiple speech environments in various settings which are motivated and adjusted by different goals and factors like identity and motivation to use either of the languages in their social context (seemingly parallel to what is argued to be affecting variability as addressed in

---

<sup>1</sup> The term assimilationist community refers to a society where conformity to the dominant culture (i.e., language, customs) is expected and highly valued. (see Bolger & Zapata, 2011; Jeon, 2008)

L2 mainstream research; e.g., Gardner & Lambert, 1982; Dörnyei & Shekan, 2008). Heritage speakers begin to switch to the majority language when they realise their home language is not valued as the majority language in the community, which results in a decrease in the use of their home language leading to the lack of will to seek more input and to use the heritage language, which eventually results in weaker linguistic competence in their heritage language.

Different from an emphasis on the weaker language, O'Grady et al. (2011) propose an emergentist approach addressing the interaction between language processor and various non-grammatical factors, and argue that changes in the phonetic composition and difficulty in spotting the semantic functions may cause heritage speakers to have problems in mapping form-meaning connections. In the emergentist view (MacWhinney, 2001) language emerges from the interaction of various non-grammatical factors, such as processing and working memory, perception and physiology, general conceptual capacities and social interaction. The processor is responsible for strengthening form-meaning mappings made available to it by other cognitive systems. O'Grady et al. (2011) specifically investigated the scopal patterns by Korean heritage speakers, including children and adults who were raised in Korean speaking homes in the United States, from the perspective of input-related factors such as salience, frequency, and transparency and the establishment and strengthening of form-meaning mappings at word and morpheme levels. According to their findings, it is argued that the phenomena that are likely to be non-acquired are the ones whose form-meaning mappings are problematic to the processor, due to the acoustically compromised phonetic profile of the form or the difficulty of recognising their precise semantic function and that the high-frequency of instantiations in the input is required for the acquisition of such mappings. Therefore, lack of high-frequency exposure to those mappings in the input may lead to non-acquisition of such features in the case of heritage language acquisition.

Another input-related concern is suggested by O'Grady and Lee (2011) who investigated a number of representative phenomena such as case, differential object marking and disjunction among Korean heritage speakers and

monolinguals. In addressing the differences in the competence of heritage speakers and monolinguals, O'Grady and Lee (2011) assume that the problems with form-meaning mappings are likely to occur when the form has low perceptual salience or the corresponding meaning is clouded by contextual indeterminacy confounding with other potential contrasts. O'Grady and Lee (2011) focus on the qualitative difference in the input available to each group and propose an 'activation and strengthening' hypothesis: acquisition takes place as particular form-meaning mappings are activated in response to unambivalent instantiations in the input.

This mapping is strengthened and maintained through continual instances for activation in comprehension and production. For heritage speakers, then, the restricted amount of input compared to monolinguals may account for the difficulties encountered in non-optimal mappings, which is generally due to the complex nature of the mapping. Thus, it is argued in the emergentist approach that the processor may fail to establish particular mappings and mechanisms as a result of the dramatic decline in the amount of input, leading to various morphosyntactic variations in terms of linguistic competence, including the difficulties that have been discussed above. The amount of exposure varies due to family and other sociolinguistic factors, which is similar to the case of L2 learners' exposure to input varying according to the time they spend inside and outside the classroom using their L2. In most places, heritage speakers' L1 input declines significantly at early years in development when these speakers start formal schooling such as kindergarden or daycare centres where they are educated in the majority language.

Besides the arguments regarding the quantity of input, research has also addressed the quality of input heritage speakers are exposed to. After examining a number of previous Portuguese heritage language acquisition studies in the USA and Europe as well their own data, Pires and Rothman (2009) propose a type of *missing-input competence divergence* approach to incomplete language acquisition according to which insufficiency of input from a non-standard dialect can effectively cause heritage speakers to show systematic mismatches in their adult knowledge of the heritage language grammar. That is, the dialectal variability found in the source of input heritage

speakers are exposed to can be responsible for linguistic outcomes of heritage language acquisition, which is also known as cross-generational attrition, as suggested by Sorace (2004, 2005), Cabo and Rothman (2012), Keating et al. (2011) and Montrul (2011) for Spanish heritage speakers in the United States, and by Polinsky (2011) for Russian in the United States.

Modelling the incomplete acquisition of heritage languages based on socio-affective factors and input insufficiency may offer valuable insights to our understanding of heritage language development since it is known from L1 and L2 acquisition studies that linguistic environment and input are critical in the construction of our overall linguistic system. However, it is also known that the development of basic and complex grammatical principles in child L1 acquisition goes beyond the stimulus in the input available to child (also known as *poverty of stimulus*, Chomsky, 1980; and *the logical problem*, Baker & McCarthy, 1981; Wexler; 1982). That is, the role of linguistic input in the development of child's language is essential but input alone cannot possibly explain the whole process of language acquisition. Moreover, the question regarding the exact quantity and quality of input required for *complete* language acquisition remains unanswered (Behrens; 2006; Lieven, 2010). Due to this mismatch between the characteristics of child's language development and that of available linguistic input, relying heavily on generalisations and estimates of the quantity of input as the essential determinant of linguistic outcomes in heritage language development may be problematic and misleading.

What is also tricky about pinpointing the quantity and quality of input in heritage language development as a key factor is that several variables inherent in the family environment where heritage speakers are exposed to initial linguistic input may differ dramatically from one individual to another in heritage language communities, thus making it even more challenging for establishing an empirical and data-driven theoretical framework (Cabo & Rothman, 2012; Montrul, 2012; O'Grady et al., 2011). As addressed in O'Grady et al. (2011), incorporating the operation of the language processor into the examination of heritage language acquisition is also promising. However, the emergentist approach in its existing framework also lacks a formal account for explaining why certain form-meaning mappings become more difficult to acquire than others and thus result in

developmental variations in environments such as heritage language acquisition.

Overall, these studies have greatly contributed to our understanding of varying levels of linguistic abilities among heritage language speakers and are highly relevant to heritage language acquisition research. However, the theoretical implications of this research agenda are rather weak, imprecise and on occasion unjustifiable. In addressing those limitations of this research program, some scholars have referred to the study of heritage language acquisition as atheoretical (Lynch, 2003; Valdés, 1997, 2005; Valdés et al., 2006), while others have addressed the necessity for developing modular theories of heritage language acquisition which can account for the organisation and interaction of different types of linguistic knowledge within the general cognitive system (Montrul, 2010, 2011). The approaches discussed above predominantly focus on the role of input and “complete” language acquisition while explaining the incompleteness of heritage language grammars based on a research agenda that has little predictive power, if any, to explain how the process of heritage languages is formally structured and how linguistic differences between complete and incomplete language acquisition can be accounted for. Thus, there still remains a need for a systematic, data-driven, formal and modular theory of language acquisition that has both the explanatory power to explain the linguistic phenomena and the predictive power to scrutinise the cognitive system of heritage language speakers and the above-mentioned linguistic outcomes of heritage language acquisition. Moreover, the field is dominated by studies on major heritage languages (i.e., Spanish, Russian); however, there are many other heritage languages of other minority communities around the world (i.e., Turkish, Kurdish, Hindi and many others) for which there is comparatively limited or no documentation of the language learning processes in monolingual, bilingual, or second language learning environments.

To that extent, in this study I adopt a perspective of language acquisition that moves away from relying on the degree of input exposure or focuses on the result of language acquisition in favour of a theoretical account which focuses on the process of language development based on cognitive procedural mechanisms. Due to the lack of imprecision and a well-defined formalism to

account for the notion of insufficient input as the main source of incomplete acquisition or “complete” language acquisition, in this study, I focus on the internal and universal mechanisms of language development by using the formalism of Processability Theory (Pienemann, 1998, 2005) with an investigation of the acquisition of Turkish as a heritage language in Germany, a heritage language which has gained less attention compared to other heritage languages that have been scrutinised in the USA and Canada.

Processability Theory is a modular theory of language acquisition that utilises Levelt’s (1989) model of language generation and LFG formalism (Bresnan, 2001), and focuses on the architecture of the human language processor and treats language acquisition as “a cognitive process by identifying mental states of the learner in terms of their casual interactions with other mental states” (Pienemann, 1998b, p.35). The explanatory power of Processability Theory based on the universal developmental hierarchy of language acquisition has been empirically tested and shown to be plausible across various typologically diverse languages (English, German, Italian, Arabic, Chinese, Japanese, Swedish) in both first and second language acquisition situations (as we shall see in Chapter 4).

Behind this theory lies Piaget’s (1980) approach to the development of cognitive structures, in which a very small set of innate ideas equips the individual to acquire concepts in all cognitive domains. This cognitive system explains the development of knowledge as an active process of mental constructions. These mental processes are called assimilation and accommodation. In the case of assimilation, children assimilate new objects into their existing schemata if the current knowledge system is compatible with the new object. Accommodation occurs when there is inconsistency between the new object and the equilibrium of the knowledge system. PT shares Piaget’s insight into the implicational nature of development and adapts Lexical-Functional Grammar (Bresnan, 2001) as the linguistic framework to formalise the psychological processes in language development. LFG is a psychologically plausible linguistic theory that can model the key psychological features of the language processor in typologically diverse languages. PT (Pienemann, 1998b) investigates language development from a cognitive perspective and aims to model the process of

language acquisition based on the universal procedural mechanisms of language production. By adopting the PT framework, I aim to provide a research model that provides a theoretically more reliable and valid representation of language acquisition process that leads to what has been previously identified as incomplete, and therefore making contributions to the predictive power of the study of heritage language acquisition.

In the next chapter, I will provide further background for the specific factors involved in this study by presenting a brief history of Turkish migration to Germany, and the relationship between the integration process and social, educational and linguistic journey of Turkish language within the Turkish community. This will be followed by a theoretical chapter explaining the mechanisms of Processability Theory formalism to show how they can be applied to Turkish grammatical structures.

## Chapter 3. Turkish as a Heritage Language in Germany

This chapter will present a brief history of Turkish immigration to Germany, which will be followed by an account of the sociocultural and linguistic outcomes of this process of immigration leading to integration within the Turkish community in Germany. The pattern of Turkish immigration to Germany presented in this chapter will make it clear how the process of societal integration, opportunities and lack of language use and education have created the identity and language of the current generation of Turkish community in Germany.

### 3.1 Turkish in Germany

The history of Turkish immigration to Germany is well documented. Soysal (2008), for example, reports that Turkish migration to Germany started as the first Turkish workers or “guestworkers (*gastarbeiter*)” left their country for Germany, in accordance with the signing of bilateral agreements between Turkey and Germany in 1961, by which Germany brought Turkish workers to boost the economic growth after the World War II. While only a small number of these Turkish migrants such as political refugees were highly educated, the rest of the early Turkish population were mainly male workers with no or little vocational training who either came from rural parts from all around Turkey, or from *gecekondu* squatter districts that were illegally constructed around big cities in the west part of Turkey, which was itself a product of an internal migration process (Abadan-Unat, 1985; Kiray, 1976).

From 1961 till 1973, about 865.000 Turkish people went to West Germany as migrant workers. As a result of the economic recession of the 1973 Oil Crisis, West Germany government decided to stop recruitment of new migrant workers (Eryilmaz, 2002). This made it even more difficult to get a work permit (Soysal, 2008). This choice led existing migrant workers to decide to settle in Germany and increased the number of those sending for their families and to reunite with them by The Family Reunification Act of 1972 (Auernheimer, 2006; Ross, 2009; Yurdakul & Bodemann, 2006). This also changed the composition of the Turkish population from a community of mostly male workers to a population with women and children, and resulted in a rapid increase of the immigrant

population. However, many Turkish women were poorly prepared for a life in Germany. They often came with no qualifications, no language skills and were sometimes even illiterate, which isolated these women from German society (Orendt, 2010).

The German governments aimed to benefit from cheap labour and initially expected the guestworkers to go back to their countries when the labour shortage was over. Due to this initial expectation of guestworkers, German governments did not put any effort in integration policies and it took over 15 years for policy makers to respond to the increasing cultural and ethnic diversity (Faas, 2008; Orendt, 2010; Zawilska-Florczuk, 2010). Within this context, according to Gaebel (2011) and Schaefer (2005), the experience of Turks in Germany is a “failed” process of integration. It is argued that this type of early treatment of the immigrants has led to a continuous problematic process of immigrant integration in Germany, which extends to today (Gaebel, 2011; Kaya, 2011; Orendt, 2010; Schaefer, 2005). Hoff (2011, p.2) reports that Turks are the minority community in Germany that “attract the most resentment” and that they were generally employed in the dirtiest jobs and remained “invisible to society at large” in the early years of immigration. It was one of Germany’s top investigative journalists Günter Wallraff in the 1980s, who adopted the identity of Turkish guest worker Ali Levent and spent two years undercover, personally experiencing the difficult life of immigrants in Germany. Wallraff exposed the shocking examples of discrimination and exploitation of Turkish workers in his best selling book called “*Ganz unten*” (*Lowest of the Low*) (Wallraff, 1988), which sold three million copies in the first three years, changed the way the German nation looked at the Turkish community, and also confronted the unacceptable conditions this workforce had been subjected to since its arrival in the 1960s.

In the last 50 years, there have been improvements on both sides; immigration and citizenship policies have changed in a positive way and many second and third generation Turks have achieved educational and professional success (Schaefer, 2005; Wegmann, 2012). Today, statistics show that with a population of almost 3 million people, Turks are Germany’s largest ethnic community (Destatis 2009, quoted after Pfaff, 2011); however, studies also show that

among all immigrant communities in Germany Turks still come last in literacy, education, living standards and employment (Gaebel, 2011; Kristen & Granato, 2007; Orendt, 2010; Özcan, 2004; Song, 2011)

### **3.2 Language Education of Turkish Immigrants**

As the politicians and authorities both in the federal level and central government level seemed to avoid the fact that Germany was becoming a country of immigration, immigrants including Turks also faced problems in Germany's school system as well as in the social and financial life (Beck, 1999; Castles, 1980; Schaefer, 2005). Orendt (2010) notes that due to the unsuccessful integration policies and change in the economy, many low skilled Turks became unemployed and their children had to grow up in an environment which did not prepare them for the state schools. Moreover, schools themselves did not expect or desire a large number of foreign children and thus were not prepared in advance to support these children either (Castles, 1980).

In the early years it was not even clear whether schooling should be compulsory for the children of Turkish guestworkers because the general understanding was that they were temporarily in Germany (Beck, 1999). Interestingly, as Lucassen (2005) reports, Turkish parents were also not concerned about the education of their children in the German education system because their intention was also to return to Turkey. Besides, education in Germany lacked a fully centralised accountability as well as a clear national integration policy since each state was able to implement the type of policy it preferred, which also created an unclear future for the guestworkers (Castles, 1980; Hackett, 2011). In these early years of immigration, Germany followed a predominantly German-only monolingual education policy which changed with the increase in the awareness of the problems immigrants faced towards integration.

**Table 2.1:** Educational responses to migration-related diversity in Germany (Hoff, 1995 as cited in Faas, 2008, p.113).

Ausländerpädagogik (foreigner pedagogy)	Interkulturelle Erziehung (multicultural education)	Antirassistische Erziehung (antiracist education)	Kulturübergreifende Erziehung (cross-cultural education)
Mainly 1960s to 1970s	Since 1980s	Since 1980s	Since 1990s
Monocultural education, assimilative, deficit-oriented approach	Multicultural education, integrationist/pluralist approaches	Anti-racist education (linked with <i>Interkulturelle Erziehung</i> )	Potentially Eurocentric education, broadly conservative approach
Politicians, teachers and parents are unsure whether or not guest workers would return to their country of origin	Minority ethnic people should be allowed to maintain their mother tongue and cultural heritage	Minority ethnic people have to struggle for racial justice and have to defend themselves against racial discrimination	Non-European people have to struggle for equality and have to defend themselves against discrimination
Provisions of single or group tuition to help children with language 'problems' (e.g., <i>Deutschfördenkurse, Vorbereitungsklassen</i> )	Attempts to establish cultural identity; provision of mother-tongue alphabetisation; teaching of all major and locally represented religions	Teaching an awareness and understanding of 'racist' structure of German society (e.g., laws, institutions); cf. multicultural education	Quarrel about teaching and contents: focus on EU countries and values versus integration of non-European cultures and religions

Table 2.1 summarises this gradual shift from a German-only assimilative education to a more integrative multicultural education. Attending German schools was made compulsory for guestworker children only after 1964, and special measures were taken to deal with the problems of foreign children (Castles, 1980; Faas, 2008). In this early period, policies reflected the nation's definition of citizenship, and were used as key mechanisms for assimilating guestworker children into a monocultural construction of German citizenship with no consideration of integrating cultural and ethnic differences within the concept of national identity (Faas, 2008; Gaebel, 2011). That is why these policies were characterised as "dual strategy" of assimilation towards immigrants by which schools assimilated children into German culture and also prepared them for returning back to their home countries (Beck, 1999; Castles, 1980). Faas (2008) notes that this assimilationist model was called "foreigner pedagogy" (*Ausländerpädagogik*), which was similar to that of special needs education for disabled children by which schools could separate classrooms for immigrants whose disability was not being German and not being able to speak German and thus not being able to follow the German educational system. However, as Castles (1980, 2004) explains, this policy was put into action in different ways in various states. For example, in Bavarian state, there were separate national classes for immigrants, while in other states there were

intensive preparatory classes in German as well as mother tongue classes and religious instruction (Beck, 1999; Castles, 1980, 2004).

Lucassen (2005) asserts that the German expectation that immigrant Turks would return to Turkey was abandoned in the 1980s when it was realised that their long term future was going to be in Germany. Moreover, the deficit-oriented and assimilationist policies of foreigner pedagogy as well as the inadequate official measures were evaded by the politicians since they led to serious educational problems by the 1980s (Castles, 2004; Gaebel, 2011). In Germany's school system, the first four years of comprehensive education in primary schools is followed by the secondary education where students are sorted into three different tracks (*Hauptschule*, *Realschule*, *Gymnasium*) (Kristen et al., 2008). The *Hauptschule* consists of general elementary education from grade 5 to 9 and leads to a minimum qualification. The *Realschule* is the general intermediate education from grade 5 to 10 leading to a medium-level qualification. While these tracks traditionally prepare for an apprenticeship, only the *Gymnasium* (grade 5 to 13) with the completion of the *Abitur* (full entrance certification) leads to university studies (Kristen & Granato, 2007). Within this educational system, Castles (2004) argues that the two main interconnected problems were that many foreign students did not regularly attend the school or went to school for only a few years due to negative experiences; and they were mostly in the *Hauptschule* which did not lead to higher education or could not proceed to the *Realschule* or the *Gymnasium* that would enable them to study at universities or gain high-level vocational training. As a result, most of them left education with no qualifications with which they would have further education or to apprenticeships in areas likely to provide good future employment.

In the 1980s and 1990s, however, a type of multicultural education developed in Germany was introduced to schools in many parts of the country to improve the situation of immigrant students (Castles, 2004; Faas, 2008), and "to prepare them for a life in a culturally diverse society; try to establish cultural identity; to guarantee mother-tongue teaching and modify curricula towards a multicultural representation of values" (Hoff, 1995 as cited in Faas, 2008, p. 110). Since the 1990s, the educational achievement rates of Turkish children with an immigrant

background have improved; nonetheless, recent studies show that Turkish children and adolescents still have much lower rates of educational success in literacy, maths and science and are still underrepresented in higher education and vocational training compared to native Germans or Italian, Greek or Russian immigrant children (Kalter et al., 2007; Lucassen, 2005; Pfaff; 2011; Söhn & Özcan, 2006; Wegmann, 2012). This is due to a complex and decentralised system of integration in the last 50 years. This has also had an impact on the survival of the Turkish language from the first generation immigrants to the second and third generation Turks in Germany. Pfaff (2012) acknowledges the high “ethnolinguistic vitality” of Turkish language in Germany throughout this period while asserting the fact that it has also undergone changes in comparison to the variety of Turkish spoken and written in Turkey partially due to inconsistent and changing educational policies.

Within the process of integration, there were mainly three types of measures taken for mother-tongue teaching since the 1960s till the end of the 1980s which varied from one state to another (Beck, 1999; Gogolin, 2005; Hackett, 2011). These were, (a) supplementary teaching of the native language as a voluntary option for immigrant children attending mainstream classes; (b) ‘mother tongue teaching’ in place of the first or second obligatory foreign language (usually English or French); and (c) ‘mother tongue’ as a subject and as language of instruction in reception classes for pupils of the same nationality (Gogolin, 2005, p.136). As mentioned above, each state was able to apply different educational policies. For example, in the Bavarian State, mother-tongue languages were taught as it was thought to be difficult for immigrants to integrate into German schools (Hackett, 2011). The ministry of culture in the Bavarian State structured a ‘bilingual’ programme, in which foreign children were placed in ‘national classes’ and taught in their native language while German was taught as their first foreign language (Beck, 1999).

In Berlin and Bremen, however, children were prepared for a future in Germany through integration and thus were required to enter normal German school classes. Until they were able to enter a normal class, the schools placed immigrant children in special courses and provided them with intensive preparatory classes intended to develop their German skills (Beck, 1999;

Castles, 1989). In other states a combined model was used to promote both German and mother tongue languages (Beck, 1999; Hackett, 2011). For instance, while in Krefeld in the state of North Rhine-Westphalia, German and non-German children were separated for some subjects and brought back together for other subjects, in Lower Saxony and Baden-Württemberg, immigrant children were allowed to choose their mother tongue as their first foreign language in schools (Beck, 1999; Hackett, 2011).

These programmes faced many problems and had to be abolished due to poor organisation, no official recognition as a regular school and allowing a further separation between immigrant children and native German children (Beck, 1999; Gogolin, 2005; Luchtenberg, 2010). However, not all bilingual programmes had to share the same end. There is a successful bilingual programme developed in Berlin in the 1990s and thus called “Berlin model.” In this model, students are assigned to two different groups for language learning and different subjects (Gogolin, 2005; Luchtenberg, 2010). While early literacy education is in the mother tongue for each group, students are also introduced to the other language (the partner language) separately in an equal number of hours, so they learn some subject in the non-German partner language while only mathematics is taught in German to all students (Gogolin, 2005).

Although there seems to be a resemblance in the mother tongue education of previous bilingual education policies and Berlin model, Pfaff (2011) highlights that the latter is a two-way bilingual education program that focuses on a better social integration in the socially diverse society, better integration into the German economy, and successful educational and economic integration within and beyond the European Union. Similar bilingual models have been developed in other states too, and there are now twenty-six such schools in Berlin, six schools in Hamburg and single schools in other large cities (Ellis et al., 2010; Gogolin, 2005; Luchtenberg, 2010). However, because there is no any centralised system to monitor and check immigrant languages and educational policies regarding immigrant languages across Germany, immigrant children may not be universally guaranteed access to initial education in their first language across each and every federal state of Germany.

### 3.3 Linguistic Outcomes in Turkish as L1

In this section I turn to some descriptive studies that have been done on Turkish as L1<sup>2</sup> in Germany. Because these studies have not been done within the mainstream framework of heritage language research, I am discussing them here so that a link can be formed between the linguistic studies and the specific constraints of social and educational context in Germany. However, since this study focuses on heritage language acquisition, the elements of the Turkish contexts that are commonly observed in heritage language studies in the wider research context will be addressed in the discussion.

Although Turks are the largest group of immigrants in Germany, there is rather limited amount of reliable data on issues such as proficiency levels in Turkish, degree of multilingualism, language attitudes, language shift, language attrition within the Turkish community as a whole (Haig & Braun, 1999). One of the earliest sets of data on the Turkish language in Germany comes from projects carried out by a group of researchers including Pfaff on Turkish children in Berlin from 1978 till early 1990s, where their Turkish and German language development was investigated from the age of 2 till the age of 12. However, one must entertain the results of these projects with caution before making any generalisations, in that the sociolinguistic situation in Berlin is not necessarily one that can be seen across Germany. Besides being Germany's capital city, Berlin also accommodates the largest population of Turks with an immigrant background in areas of very high density of Turkish people (Hottmann, 2008). Haig and Braun (1999) note that the investigations in Pfaff's studies in Berlin were carried out in the areas with exceptionally high Turkish population density (50 per cent of the children from 6 to 15 are Turkish), and thus the characteristics of the acquisition process of Turkish may differ in other areas in Germany with a lower Turkish population.

Pfaff (1993) found that Turkish children acquired Turkish and German sequentially rather than simultaneously despite regular input in both languages, and that some were "Turkish dominant" while others were "German dominant".

---

<sup>2</sup> Although there are number of studies focusing on the acquisition of Turkish as L2 in different contexts (e.g., Haznedar, 2003; Montrul, 2001; Papadopoulou, 2011), to my knowledge there are no studies investigating Turkish as L2 in Germany.

In the same study, Pfaff (1993) investigated the acquisition of Turkish by “Turkish dominant” immigrant children and found that their process of acquiring Turkish was almost the same as monolingual language acquisition and that the inflectional morphology was “virtually indistinguishable” from that of their monolingual peers. Even the German-dominant children did not make errors apart from very few errors in case marking (up to 10-15 per cent maximum) and subject-verb agreement (up to 5 per cent maximum) (Pfaff, 1993, 1994). Another issue that is highlighted in Pfaff’s studies is that the more competent the Turkish children were in German, the more frequently they code-switched between Turkish and German (Pfaff, 1994, 1997, 1999). While acknowledging the similar acquisition patterns between monolinguals and bilingual Turks, Backus (2004) and Herkenrath (2012) assert that in the bilingual situation the balance of the two languages is likely to shift towards the majority language due to a dramatic decrease in the amount of Turkish input as bilingual children experience a German-dominant environment with the start of schooling, which, as mentioned above, does not provide students coming from an ethnic background with formal education in their home language.

Besides similarities in the process of acquisition, studies have discovered some differences between the speech of bilingual Turkish immigrants and that of monolingual Turkish children. For instance, bilingual Turkish immigrants used overt subject pronouns more frequently (Pfaff, 1991, 1993) (Turkish grammatical structures will be explained in detail in Chapter 5). For instance, while (3.1) is produced with pro-drop feature by a Turkish-dominant child without an overt pronoun, the German-dominant child uses the redundant overt pronoun in (3.2) which is not appropriate in the context (Pfaff, 1993, p.128).

- (3.1) Orhan,           sari   top-u           al-abilir-mi-yim?  
           Orhan,           yellow ball-ACC   take-ABIL-Q-1.SG  
           ‘Orhan, may I take the yellow ball’
- (3.2) \*Peter, sen   bana top-u           ver-ir-mi-sin?  
           Peter you   me   ball-ACC       give-PRE-Q-2.SG  
           ‘Peter, will you give me the ball?’

It was also found that Turkish dominant children and monolingual children used non-finite verbs in adverbial clauses, while German dominant children never used these forms or never acquired them in the first place (Pfaff, 1993). Moreover, while Turkish dominant children over-marked possessive nouns, German dominant children were more likely to omit the possessive marker. In the syntactic domain, Sari (1994; as cited in Haig & Braun, 1999), found that subjects of nominalisation in subordinate clauses generally lacked genitive marking and that Turkish speakers who were raised in Germany used fewer subordinate structures than monolinguals in Turkey.

In a qualitative study, Herkenrath et al. (2003) investigated the innovative constructions of Turkish-German bilingual children that are not found in the data of the monolingual Turkish control group, with a particular focus on the non-interrogative *wh-* constructions as subordinators. The non-interrogative *wh-* constructions as subordination in monolingual Turkish contain a verb with non-finite suffix (*-dik* or *-dig*) with possessive suffix (subject agreement) as in (3.3)

(3.3)

Ahmet-in kutu-lar-i nasıl tasi-dig-i-ni bil-mi-yor-um.

Ahmet-GEN box-PLU-ACC how carry-PART-POSS-ACC know-NEG-PRE-1SG

'I do not know how Ahmet carried the boxes.'

Herkenrath et al. (2003) found that in such constructions in bilingual Turkish, infiniteness in the subordinate clause was cancelled with no use of morphological suffixes such as nominalising, possessive or case marking on the verb. Similarly, Herkenrath (2012) presented the data from a case study of one Turkish-German bilingual girl to compare the use of subordinating constructions involving nominaliser *-dik* between monolingual Turkish children and Turkish-German bilingual children. As a whole, Herkenrath (2012) found that Turkish-German bilingual children were able to use and control *-dik* construction to a lesser degree than the monolingual children.

Treffers-Daller et al. (2007) contribute to this discussion by a quantification-based analysis of complex embeddings (noun clauses, adverbial clauses and relative clauses), which were ranked according to their morphological complexity according to a previous framework (Özsoy & Erguvanlı-Taylan,

1989) in the speech of three different groups of Turkish-German bilinguals and one monolingual control group (average age of all groups on recording was 19.7). Treffers-Daller et al. (2007) found that young Turkish-German bilingual adults who were born and raised in Germany used fewer, and less complex embeddings than their monolingual peers who were born and lived in Turkey all their lives and than Turkish-German bilingual returnees who were born in Germany and had lived in Turkey for eight years at the time of recording. The results indicate that informants of the second generation “fail to acquire a number of aspects of Turkish grammar, and replace these with more analytical means of expression” (Treffers-Daller et al., 2007, p.271). Treffers-Daller et al. (2011) refers to Verhoeven (2004, p.443) who identifies this situation as “a substantial erosion of the grammatical system of Turkish” as spoken in Germany, especially if the immigrant speakers of Turkish become the main source of input for the heritage speakers. Similarly, Backus (2004) notes that there is a tendency towards “the replacement of synthetic means of clause linkage and subordination (or at least their decreasing usage), especially of relative clauses, by simple juxtaposition” (p.715), as also demonstrated by Aarssen (1996) among Turkish-Dutch bilinguals, in Bayraktaroglu (1999) among Turkish-English bilinguals, and Akinci and Jisa (2000) among Turkish-French bilinguals.

A generally embedded question in the context of these studies, which was addressed in the previous chapter as cross-generational attrition in heritage languages (Pires & Rothman, 2009), is whether a new variety of Turkish has emerged in Germany and in Western Europe mostly as a result of contact with host languages (Backus, 2004, p.694). Although these studies provide examples of the linguistic creativity of Turkish people, there is a lack of systematic and formal studies in the existing literature to account for the structural change these particular grammatical variables might have undergone (Backus, 2004; Herkenrath et al., 2003). Moreover, Johanson (1999, p.251) argues that it is too early to define any of these immigrant varieties in North-west Europe as a new variety of Turkish considering the very short history of Turkish in contact with European languages. Therefore, without empirical evidence it would be rather problematic to assume that the systematic mismatches between the linguistic profile of Turkish heritage speakers in

Germany and that of monolingual Turkish results from exposure to a type of input that is primarily different from the monolingual variety in Turkey in the first place.

In the light of the available findings, Backhus (2004) notes that this variability in immigrant children's Turkish has not affected the core grammar that is acquired during early years of childhood. However, in a comparison with their monolingual peers in Turkey, Backus (2004, p.699) argues that

“there may be more evidence of change in the speech of older children, partly because their more or less completed acquisition process allows the study of the peripheral and more complex elements of syntax [such as embedded clauses and subordination], which may be more subject to external influence or imperfect acquisition, and partly because of the shift in dominance patterns, which make such phenomena progressively more likely.”

This position of separating the core grammatical structures from the complex elements of syntax in Turkish also conforms to the findings on the acquisition of Turkish in a monolingual setting and the influence of different contact languages on the varieties of Turkish spoken in Europe. Slobin (1977, 1986) and Aksu-Koç (1994) found that complex structures in Turkish such as relative clauses (3.4) and complement clauses (e.g., nominalisation with *-dik*<sup>3</sup> in 3.5) do not appear until the age of 5 in a monolingual environment.

(3.4) Bizim ev-in önün-e gel-en kedi-ye benzi-yor.  
 Our house-GEN front-DAT come-S.REL cat-DAT  
 resemble- PRE-3.SG

‘It looks like the cat that comes to the front of our house.’

(3.5) Oyuncak ol-dug-u için uc-ma-z.  
 Toy be-PART-GEN for fly-NEG-AORIST.

‘Because it is a toy it does not fly.’

---

<sup>3</sup> In Turkish, the distribution of vowels and consonants within a word is governed by Vowel Harmony and Consonant Harmony. Vowels share the specification for backness and, if they are high, they also share the specification for rounding. Some consonants (more specifically, the oral velar stops and the lateral) are palatalized in the environment of front vowels. The vowel and consonant harmony, voicing assimilation, and other phonological processes, result in considerable variation in the surface forms of morphemes (for more detailed descriptions of these generalizations and some exceptions, see Kornfilt, 1997).

Slobin (1977, p.194) also found that that speakers of Turkic languages who lived in contact with Indo-European languages often replaced the participle constructions used in the formation of complex structures (e.g., relative clauses) by more analytical forms as in (3.6), while keeping the Turkic inflectional morphology intact, and thus proposed that “forms which are late to be acquired by children are presumably also relatively difficult for adults to process, and should be especially vulnerable to change.”

(3.6) Oyuncak-lar-i            götür-dü-n            onun için    kız-di.  
 Toy-PLU-ACC            bring-PAST-2.SG    that    for    annoy-PAST-3.SG

‘You brought the toys, that’s why she got annoyed.’

In these studies, the complexity and late acquisition of Turkish grammatical structures such as relative clauses and complement clauses are accounted for by a set of operating principles (Slobin, 1973, 1985) which briefly focuses on the processing of language and the discovery of its formal and functional properties. In his review of Slobin’s (1985) operating principles, Weist (1989) criticises that they are unhelpful and vague in explaining how language acquisition works as these principles are descriptions of *what* the child is doing rather than mental representations and processes of *how* the child is doing it. Moreover, Bowerman (1985) notes that the operating principles do not have a theory of grammar that explains the deeper syntactic principles of surface variability. Pienemann (1998) also criticises Slobin’s operating principles in that they do not contain procedural information to implement the micro-structure of language processing. As we shall see in Chapter 4 and Chapter 5, PT’s processing procedures based on LFG’s (Bresnan, 2001) feature unification and mapping principles provide a theoretically more plausible account for why grammatical structures are acquired in a hierarchical fashion in a sense that some are acquired early and some late.

Overall, with respect to the studies reported here, majority of Turkish children with an immigrant background in Germany seem to differ from their monolingual peers in Turkey in their use of Turkish and fail to demonstrate the mastery of certain complex structures which are also liberally used by their monolingual peers. Two main factors have been highlighted to account for this type of

linguistic outcome: the relative age of the acquisition of complex structures and the shift from dominant use of Turkish to dominant use of German due to schooling at early ages. However, similar to the limitations of the literature on heritage language acquisition in general, these studies also lack a formal explanation to account for the late acquisition of these complex structures and how grammatical development may lead to a complete or incomplete acquisition among Turkish immigrant speakers. As also acknowledged in the heritage language literature (Montrul, 2008, 2011; Polinsky, 2007; Rothman, 2007), our knowledge about structural properties of heritage language acquisition, which is generally referred as “incomplete” is very limited. The current study is an attempt to contribute to our understanding of heritage speakers’ language acquisition by providing a developmental perspective, based on the universal processing mechanisms of Processability Theory (Pienemann, 1998b, 2005). Processability Theory (Pienemann, 1998, 2005) is a well-established and plausible language acquisition theory that uses the formalisms of Lexical-Functional Grammar (Bresnan, 2001) to account for the developmental hierarchy of grammatical structures across typologically diverse languages.

The following chapter is an overview of Processability Theory, its formal processing mechanisms, which will be foundation of the focus of this study while constructing the grammatical descriptions and developmental hierarchy for targeted Turkish grammatical structures. This foundation also provides a plausible rationale for my own account of the developmental stages in Turkish and why linguistic phenomena focused in this study are predicted to be acquired hierarchically.

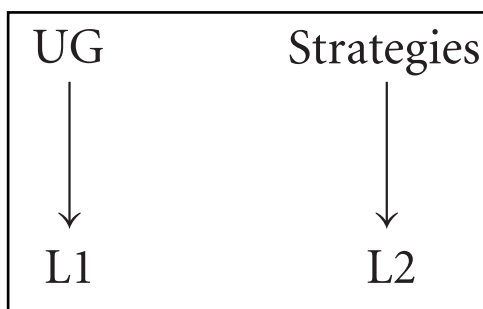
## Chapter 4. Processability Theory

This chapter provides an overview of PT's theoretical and formal mechanisms that are used in the formation of universally applicable developmental hierarchy of language acquisition. Based on this theoretical account, I will go on to present a novel application of the PT formalism on Turkish grammatical structures as well as justifying its application to heritage language acquisition in the wider context and more specifically in Turkish as a heritage language.

Processability Theory was first introduced in 1998 (Pienemann, 1998a, 1998b), and was extended in 2005 by Pienemann, Di Biase and Kawaguchi. In the 1998 version, PT (Pienemann, 1998b) exclusively focused on describing the universal developmental route of language acquisition, also known as the developmental problem. In its extended version (Pienemann et al., 2005) PT is also able to account for the issue of the logical problem in language acquisition, which essentially states that “the children acquire in a relatively short period of time and on the basis of limited linguistic input the basic principles of their native language, although it is assumed that many of these principles cannot be inferred from the observations made by the learner” (Pienemann, 1998a, p.2). Since its first introduction in 1998, PT has been applied in various SLA studies, which have tried, tested and supported the theory's plausibility in a range of typologically different languages including German and English (Pienemann, 1998b, 2005), Swedish (Håkansson, 2001), Arabic (Mansouri, 2005), Chinese (Zhang, 2005), Japanese (Di Biase & Kawaguchi, 2002; Kawaguchi, 2005, 2010) and Italian (Di Biase & Kawaguchi, 2002).

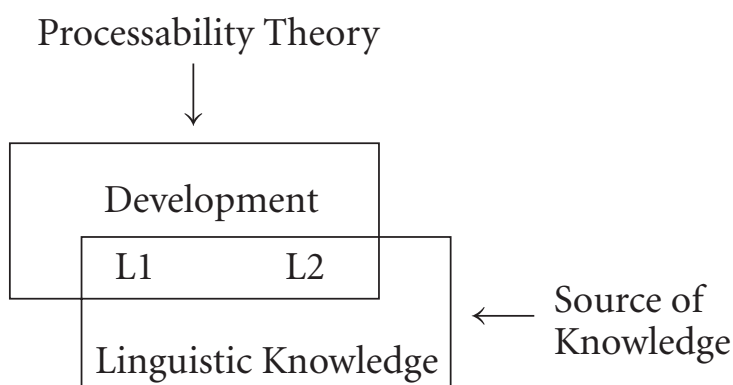
Although PT was originally designed as a theory of second language acquisition, Pienemann (1998b) proposes that processability principles can also be applied to first language acquisition since native and non-native language production follow the same fundamental principles of language processing which are based on the architecture of the human language processor. In this vein, Pienemann (1998b) criticises a number of previous SLA theories, the study of Clahsen and Muysken (1996) in particular, that argue for no access to UG, the Fundamental Difference Hypothesis (e.g., Felix, 1984; Clahsen, 1990; Meisel, 1991). According to this hypothesis, the difference between L1 and L2

acquisition is that L1 learners have access to UG while L2 learners do not, and use general cognitive strategies which is illustrated in the following figure.



**Figure 4.1:** The relationship between explanandum and explanans according to the Fundamental Difference Hypothesis (Pienemann, 2005, p.36)

In his comparison of grammatical development in German L1 and German L2, Pienemann (1998b) argues against this notion of “UG for L1 and processing factors for L2” by showing that the same hierarchy of processing procedures applies to both L1 and L2 acquisition while each of them follows different developmental paths. Figure 4.2 illustrates Pienemann’s (1998b) account for the relationship between the explanandum and explanans, and the role of processing mechanisms in L1 and L2.



**Figure 4.2:** PT view on the explanatory devices in L1 and L2 acquisition (Pienemann, 1998b, p.310)

UG-based theories address the source of linguistic knowledge (the logical problem), while processing components of PT address the development of linguistic structures (developmental problem) in L1 and L2.<sup>4</sup> Pienemann (1998b,

<sup>4</sup> In its extended version (Pienemann et al., 2005) PT addresses the logical problem too, which will be discussed below.

p.315) concludes that “all grammars are processable at the time they develop, and each grammar builds upon the processing procedures acquired at the previous stage in a cumulative fashion.” Thus, relying on this universal hierarchy of processability procedures, the Processability Theory account provided in this thesis will address the acquisition of Turkish as target language acquisition while explaining the developmental hierarchy.

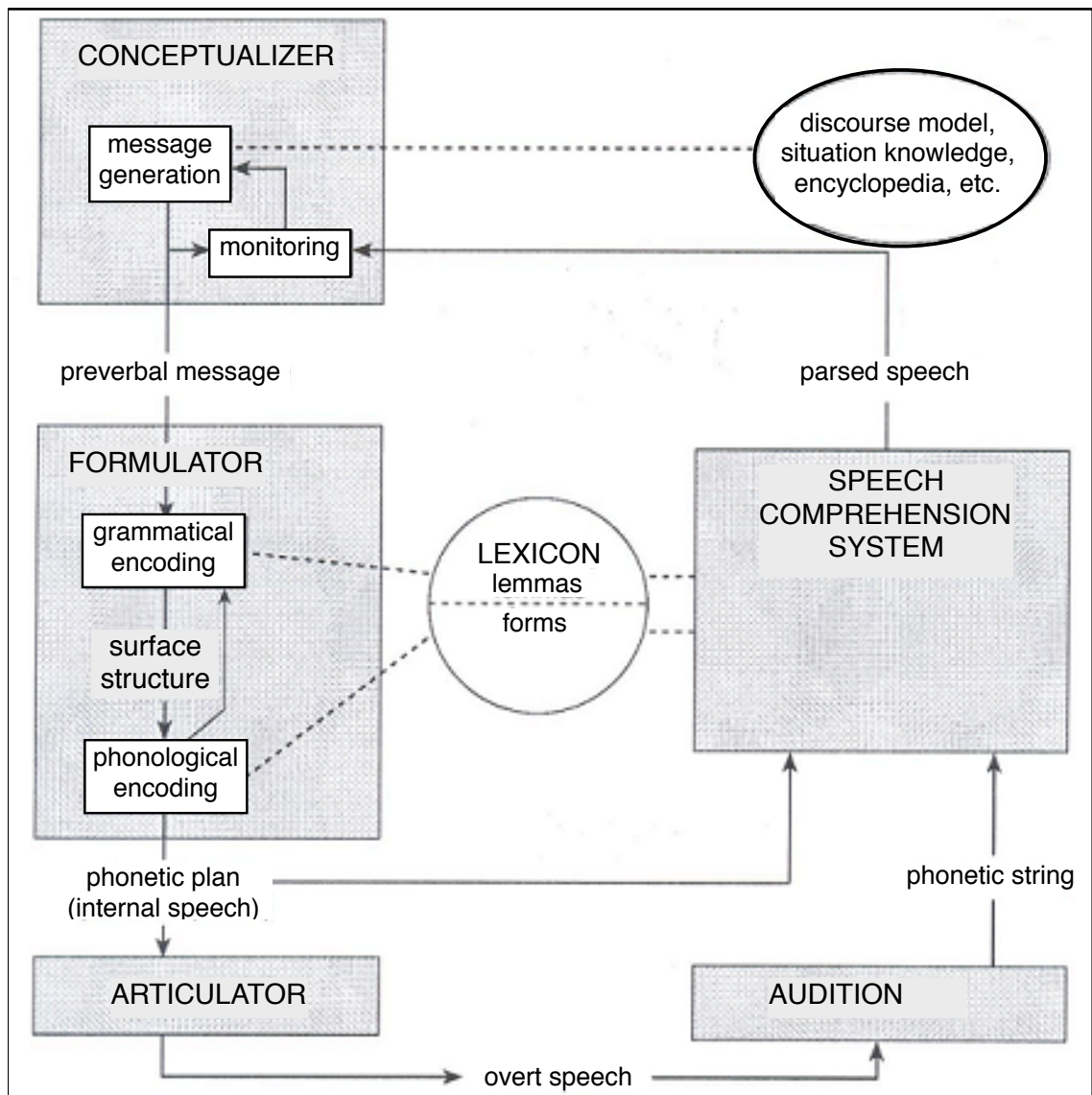
As a psycholinguistic approach to language acquisition, PT is based on the assumption that language development is constrained by the general architecture of the human language processor, which contains various computational constraints (Pienemann, 1998b). These computational constraints are procedural skills that are needed to process the target language. PT focuses on these computational constraints and aims to “determine the sequence in which procedural skills develop in the learner” (Pienemann 1998b, p.2). Although there may be individual variations in the amount of acquisition, the order of the acquisition of these procedural skills is argued to be universal (Pienemann, , 1998b, 2005). The key idea behind PT is that language acquisition is constrained by language processing; that is, “at any stage of development the learner can produce and comprehend only those L2 linguistic forms which the current state of the language processor can handle.” (Pienemann, 2003, p.686).

PT’s universal approach to the hierarchy of processing procedures is based on Levelt’s (1989) model of speech production and Kempen and Hoenkamp’s (1987) incremental procedural grammar (IPG) for sentence formulation which was devised as a cognitive model for formulating output of spontaneous speech (Dutch) using semantic-based lexical input. The linguistic domain of the theory is formally modelled on Lexical-Functional Grammar (Bresnan, 2001; Kaplan and Bresnan, 1982). Adopting Levelt’s (1989) psycholinguistic model of speech production allows PT to describe the mental operations that are applied to this linguistic knowledge.

In PT there are mainly four characteristics of language production that are based on Levelt’s (1989) model. The first characteristic is that language processing is autonomous; that is “processing components are relatively autonomous specialists which operate largely automatically” (Pienemann,

1998a, p.2). The second characteristic is about the incremental nature of processing. Lexico-grammatical forms are gradually constructed while conceptualisation is still continuing, that is "...the next processor can start working on the still incomplete output of the current processor..." (Levelt, 1989, p.24). The third characteristic is the linearisation problem (Levelt, 1989), which means that the underlying meaning may not be linear while the output of the processor is. For instance, the order of clauses and the natural order of events may not create linearity, as in a sentence like "Before the boy went to bed, he read his book." In this sentence, the event in the second part occurs before the one in the first part, which creates a non-linearity. Production of this type of sentences is only available when the proposition can be stored in memory. The last characteristic is that grammatical processing utilises a grammatical memory store (Pienemann, 2005). According to Levelt (1989), the grammatical memory store is highly task-specific in which specialised grammatical processors can deposit information of a specific nature.

In Levelt's (1989) speech production model (Figure 4.3), language production starts with the generation of the preverbal messages, which is dealt with in the *Conceptualiser*. These messages containing conceptual information about the speaker's intention are constructed in the *Formulator* by its two subcomponents; the Grammatical Encoder accesses lemmas and builds grammatical relations matching the meaning of the message, which is called surface structure; and the Phonological Encoder generates a phonetic plan according to this surface structure. The physical production of the message is handled by the *Articulator*, "which unfolds and executes the phonetic plan as a series of neuromuscular instructions" (Levelt, 1989, p.27).



**Figure 4.3:** Levelt's language production model (Levelt, 1989, p.9)

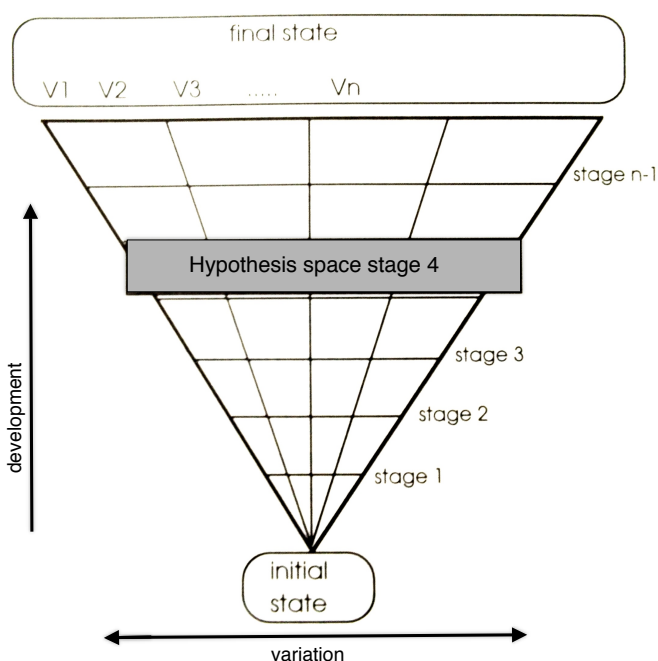
PT addresses the process of grammatical encoding in the Formulator, which as mentioned above accesses the concept of a message and generates the required grammatical procedures in relation to the intended meaning, and constructs the phonological plan to be sent to the Articulator. For example, in production of a phrase like *bir cocuk* 'a child', the following processes are followed by a fully competent speaker as discussed by Pienemann (2005, p. 7-9). First of all, the concepts underlying this phrase are produced in the Conceptualiser. Then, the lemma COCUK is activated in the Conceptualiser. Since this lemma is annotated for the category information N, the categorial procedure NP is called. The categorial procedure checks for the possible complements, specifiers and diacritic features (such as number), and ensures that the NP has the necessary ones. This procedure builds noun phrases, with

N as the head of the phrase. The exchange of grammatical information between the head N and the other features of NP is a core characteristic of language production and comprehension too. For this lemma to be a part of a message such as *bir çocuk aglıyor* 'a child is crying', the newly created phrase is assigned a grammatical function - in this example it would be appointed Subject, whose functional destination is defined through Appointment Rules (Pienemann, 1998b, p.69). This functional specification of the phrase NP as Subject calls for the S-procedure, which accepts the functional specifications of NP, namely the values for "person" and "number". As mentioned above, this whole process of language production is incremental (Kempen & Hoenkamp, 1987; Levelt, 1989); that is, the concepts of messages are gradually constructed while the output of the previous conceptual structure in the Formulator is sent to the Articulator. Levelt (1989) demonstrates that during this incremental process of producing utterances, processing procedures are implicationally related in the following order:

1. Lemma access
2. The category procedure (lexical category of the lemma)
3. The phrasal procedure (instigated by the category of the head)
4. The S procedure and the target language word order rules
5. The subordinate clause procedure (if applicable)

This implicational nature of language generation (1  $\supset$  2  $\supset$  3  $\supset$  4  $\supset$  5) suggests that the S-procedure can determine the function of a phrase only if a word has been retrieved from the lexicon in Level 1, and its phrasal category (Level 3) has been determined through procedures in Level 2. As we shall see in Chapter 5, subordinate clause procedure become available for Turkish relative clauses because they involve non-canonical word order rules and specific morphological operations which signal the long-distance dependency between the gap and the displaced element in the subordinate clause. In PT, each of these key grammatical encoding procedures is hierarchically ordered and a procedure at a lower level is seen as the prerequisite for the next procedure (Pienemann, 1998b, 2005).

While the processability hierarchy is universal and the time-sequence of this hierarchy cannot be altered, PT is able to predict the possible linguistic variations which are also constrained by the processing procedures in each stage of the developmental hierarchy. Pienemann (1998b) refers to these variations as the possible leeways and introduces the notion of the Hypothesis Space, which explains the relationship between the hierarchy and these possible leeways, and identifies the structures that are processable at each developmental stage. The concept of the Hypothesis Space is illustrated as follows:



**Figure 4.4:** Hypothesis Space, development and variation (Pienemann, 1998b, p.232)

The Hypothesis Space determines the constraints of the processing procedures that enable the production and comprehension of the range of structures that are available to the learner. Due to its implicational nature, the developmental hierarchy is represented vertically while the linguistic variability within each processing stage is viewed horizontally. Pienemann (1998b) demonstrates this linguistic variation with the formation of *wh*-questions in English, which requires the application of the rule “Aux-2nd” acquired at stage 5 in the hierarchy. The second position of auxiliaries in English *wh*-questions and possible linguistic variations are illustrated by Pienemann (1998b, p.240) in the following examples:

(4.1) Where is he going?

The following variability in the formation of wh-question occurs since the learner's grammar has not reached stage 5 yet.

(4.2) \*Where  $\emptyset$  he going? (omission)

(4.3) \*Where is  $\emptyset$  going? (omission)

(4.4) \*Where he is going? (violation)

(4.5) \*He is going *where*? (avoidance)

Each of these variations is constrained by the available processing mechanisms learners have at that moment of language production, which results in the avoidance of the "Aux-2nd" rule since the necessary processing mechanisms have not been acquired yet. The hierarchy of processing procedures is based on the exchange of grammatical information within and between the phrases of a sentence (Pienemann, 1998b). This process of exchange of grammatical information is captured by *feature unification* in Lexical-Functional Grammar (Bresnan, 2001; Kaplan & Bresnan, 1982). LFG formalisms enable PT to be applied to typologically diverse languages. The processing hierarchy that is based on feature unification is illustrated by Pienemann (1998b, 2005) as follows:

- a. No exchange of grammatical information
- b. Exchange of grammatical information within the phrase
- c. Exchange of information within the sentence

According to Pienemann (2005, p.15) the architecture of LFG coincides with key principles in language processing that can be applied to the hierarchy of grammatical information matching in any language. On the basis of the implicational process of language generation and the matching of grammatical information within and between the phrases, Pienemann (1998b, 2005) offers the processability hierarchy which captures the order of the procedural skills required for processing the target language. In Pienemann (2005, pp.7-12), this process is explained with the generation of sentence like "A child gives a cat to his mother." In this sentence, the generation of the noun phrase "a child" is

different from the verb phrase “gives a cat to his mother.” The NP “a child” requires matching of grammatical information within the phrase (“a” and “child” share the same value *singular*). However, the VP “gives a cat to his mother” is achieved by matching of grammatical information between two different phrases (both the subject value in “a child” and the verb “give” have to contain the same grammatical information “3rd singular”). The language processor can check whether these elements share the same features only if the language learner has acquired the necessary procedures to generate these phrases in that language.

Pienemann (1998b, 2005) develops the idea that the noun phrase is generated before the verb phrase, and then the sentence is formed, and that the processing of the first one is a prerequisite for the processing of the next one. This processing hierarchy is in line with the time sequence of language production model of Levelt (1989) which is determined by grammatical feature unification (Bresnan, 2001). Pienemann (1998b, 2005) also proposes that this processing hierarchy is universal and can be observed in all grammars, either in first language acquisition or in second language acquisition. Pienemann (1998b, 2005) tested this hypothesis with a detailed comparison between German L1 and L2 within the constraints of Hypothesis Space.

**Table 4.1:** Comparison of grammatical development in L1 and L2

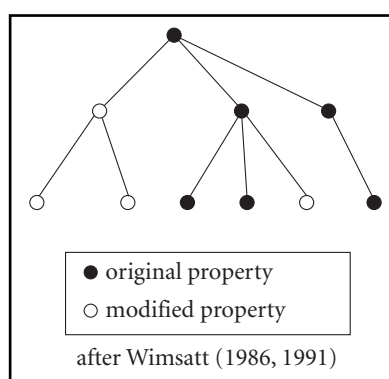
stage	exchange of information	resources	GL2	German L1
6	within subordinate clause	+/- ROOT	V-End	V-End (no errors)
5	inter-phrasal	S-Procedure	INV ±agr	V2nd +agr
4	phrasal	VP-Procedure	PART	–
3	none	lexical categories	ADV	– b
2	none	lex. categories	SVO	a SOV variable word order
1	none	lexical entries	words	words

(Pienemann, 2005, p.41)

Table 4.1 shows the comparison of grammatical development between German as a second language (GL2) and German as a first language (German L1), in

which different developmental trajectories for L1 and L2 are located within the constraints of Hypothesis Space. Pienemann (2008, p.18) argues that this developmental difference results from the fact that L1 learners and L2 learners start with different initial hypotheses, and “the structure entailed in the initial hypothesis propagates through the entire developmental process.” While the L1 learner starts with SOV word order and preserves it to reach the target language with only one other adjustment (V2nd with SV agreement), L2 learner initially uses SVO word order which is kept through five stages introducing various ungrammatical structures which are adjusted in the process<sup>5</sup>. Although there are two different development routes, PT’s universal hierarchy of processing procedures can account for both of them (Pienemann, 1998b).

From the perspective of target language acquisition, Pienemann (1998b) proposes that it is expected to see variations in language development, which is an outcome of developmental dynamics. The idea of developmental dynamics in PT is based on Wimsatt’s (1986, 1991 quoted after Pienemann, 1998b) *generative entrenchment model* for the development of embryo in animals, which captures the gradual development of an egg into a very complex entity in a predetermined order. By applying this developmental complexity and its consequences in the growth of the embryo, Pienemann (1998b) asserts that the decisions that are made earlier in the developmental path during language acquisition will influence the further development and thus the ultimate stage of the development in the target language.



**Figure 4.5:** Structural developmental in generative entrenchment (Pienemann, 1998, p.317)

<sup>5</sup> Pienemann (2005, p.104) acknowledges that in terms of word order phenomenon Turkish learners of German start with SOV word order by taking advantage of their L1 processing skills once their interlanguage has developed to the point at which the L1 structure is processable. Similar findings regarding the acquisition of word order have also been reported in other studies (Vainikka & Young-Scholten, 1994, 2011).

Figure 4.5 displays how structures are preserved in the developmental process from top to bottom while they increase in the complexity with the addition of other properties throughout development. This diagram also shows the availability of different developmental paths. As Pienemann (2005, p.42) states, the significance of the concept of generative entrenchment in language acquisition is that “a massive computational saving can be made if structural decisions do not have to be revised in the developmental process every time a structural change occurs.” By this process, early decisions, which are generally very difficult to change once made, spread through the development process and shape the ultimate outcome without having recourse to them again and again. As the ‘body plan’ remains the same, a computationally more efficient development is achieved.

#### **4.1 Lexical Functional Grammar**

According to Di Biase (2007), integrating LFG formalisms enables PT to become universally applicable for typologically diverse languages in that its interpretation of developmental hierarchy can be utilised for the grammatical structure of any language. LFG serves as the means of analysing morphological and syntactic structures in any language that are fed into the hierarchy of processing procedures in PT. This is mainly achieved by feature unification as discussed above, where Pienemann (1998, p.73) points out that

“...the unification of lexical features, which is one of the main characteristics of LFG, captures a psycholinguistically plausible process that involves (1) the identification of grammatical information in the lexical entry, (2) the temporary storage of that information and (3) its utilisation at another point in the constituent structure.”

Lexical-Functional Grammar is a lexically driven and involves parallel grammar where the levels of representation of linguistic information exist in parallel without one being prior to any of the others. (Falk, 2001). While the term lexical stands for the principle of Lexical Integrity, which states “words are the atoms out of which syntactic structure is built”, the term functional means “grammatical functions, notions like subject and object” (Falk, 2001, p.4-10). The main components of LFG that are relevant to predictions of PT are the lexicon, c(onstituent)-structure, f(unctional)-structure and a(rgument)-structure (Bresnan, 2001). In its original version (Kaplan & Bresnan, 1982), LFG utilised c-structure

and f-structure only; however, in its revised version (Bresnan, 2001) a-structure is included, which strengthens the typological plausibility of the theory without deviation from its original design. PT also evolved in line with the revisions in LFG. While the 1998 version of PT (Pienemann, 1998b) made use of principles of early LFG to account for development of morphosyntactic structures, the extended version of the theory in 2005 (Pienemann et al., 2005) incorporates the revised version of LFG to explain the non-linearity of syntactic structures.

The lexicon stores information about the lexical elements of a language such as syntactic and other information that is relevant to the production of sentences. The role of f-structure in LFG is to construct the relationship between the grammatical information and the semantic interpretation that is needed to create the meaning of a sentence. A(argument)-structure assigns predicates their argument roles, who does what to whom. It is related to the lexicon. It is based on the universal hierarchy of argument roles such as agent, experiencer, locative or patient. C(onstituent)-structure is the representation of the components that generates the surface structure of constituents in a sentence. The lexical entries can be seen in the analysis of the Turkish sentence *Çocuk kurbagayı izliyor*<sup>6</sup> ‘The child is watching the frog’:

çocuk	N	PRED	= <i>çocuk</i> ‘child’
		PERS	= SG
		NUM	= 3
izliyor	V	PRED	= <i>izle</i> ‘watch’ <SUBJ, OBJ>
		TENSE	= PRE
		ASPECT	= CONT
		PERS	= SG
		NUM	= 3
kurbagayı	N	PRED	= <i>kurbaga</i> ‘frog’
		NUM	= SG
		CASE	= ACC

---

<sup>6</sup> Turkish is a highly inflected, agglutinative language with rich morphology. Verbs are marked for tense, aspect, mood and polarity, and subject agreement, and nouns are marked for case and plural (for details see Chapter 5).

As in the above example, each lemma includes a number of syntactic and other properties of lexical items by assigning values to features (e.g. NUM = SG). The f-structure lists which grammatical roles the arguments of the predicate have, as well as the grammatical information such as number, tense and case. The f-structure of the above sentence is illustrated as follows:

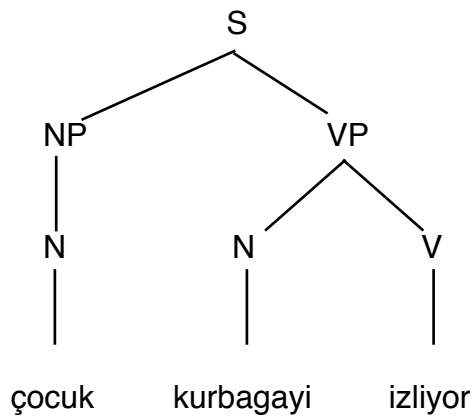
PRED	izle 'watch' <SUBJ, OBJ> TENSE PRE ASPECT CONT						
SUBJ	<table style="border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px 5px;">PRED</td> <td style="padding: 2px 5px;">çocuk 'child'</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px 5px;">NUM</td> <td style="padding: 2px 5px;">SG</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px 5px;">PERS</td> <td style="padding: 2px 5px;">3</td> </tr> </table>	PRED	çocuk 'child'	NUM	SG	PERS	3
PRED	çocuk 'child'						
NUM	SG						
PERS	3						
OBJ	<table style="border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px 5px;">PRED</td> <td style="padding: 2px 5px;">kurbaga 'frog'</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px 5px;">NUM</td> <td style="padding: 2px 5px;">SG</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px 5px;">CASE</td> <td style="padding: 2px 5px;">ACC</td> </tr> </table>	PRED	kurbaga 'frog'	NUM	SG	CASE	ACC
PRED	kurbaga 'frog'						
NUM	SG						
CASE	ACC						

**Figure 4.6:** f-structure for *Çocuk kurbagayı izliyor*

F-structures are constrained by two main well-formedness conditions which determine whether sentences are grammatical or not. These are:

- a. **Completeness Condition:** All argument functions specified in the value of the PRED feature must be present in the local f-structure. All functions that receive a thematic role must have a PRED feature.
- b. **Coherence Condition:** All argument functions in an f-structure must be selected by their local PRED. Any argument function that has its own PRED feature must be assigned a thematic role (Falk, 2001, p. 61).

F-structure therefore makes it possible to encode information about grammatical relations between the predicate and arguments of a sentence, which are “invariant or universal aspects of grammar” (Fabri, 2008, p.42). While f-structure lists grammatical attributes of constituents, such as TENSE with values such as present, c-structure specifies the structural relationship between constituents in the phrase and their internal order in the sentence, which is language-specific.



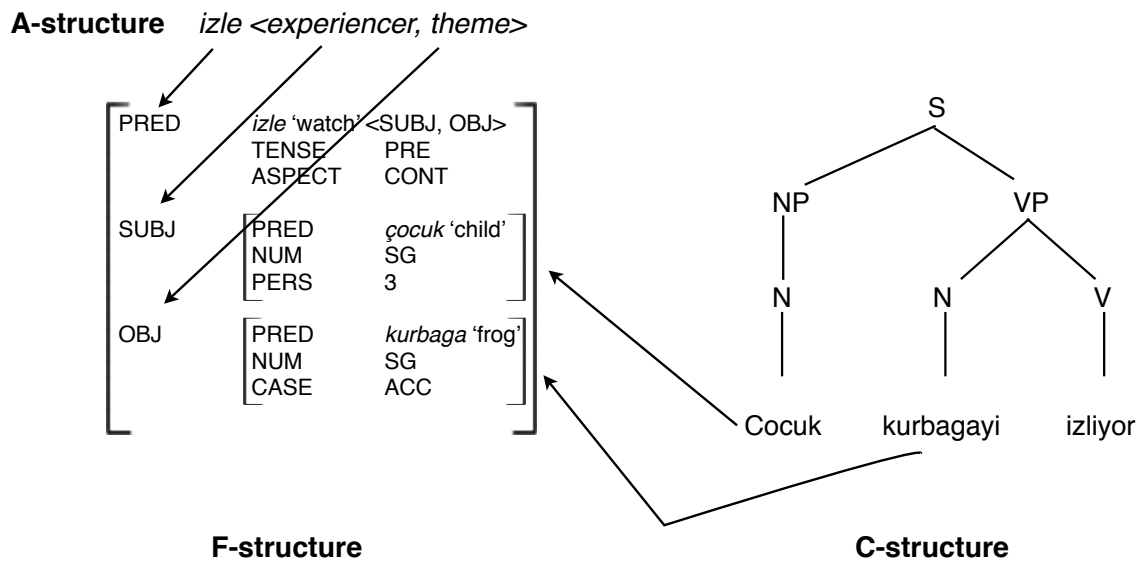
**Figure 4.7:** c-structure for *Cocuk kurbagayi izliyor*

Phrase structure rules that generate the c-structure in Figure 9 are illustrated as follows:

$$\begin{array}{lcl}
 S & \rightarrow & NP_{\text{SUBJ}} \quad VP \\
 NP & \rightarrow & N \\
 VP & \rightarrow & V \quad NP_{\text{OBJ}}
 \end{array}$$

**Figure 4.8:** c-structure rules for *Cocuk kurbagayi izliyor*

In a-structure, arguments of a given predicate are systematically mapped to argument functions such as SUBJ and OBJ. Fabri (2008, p.54) shows that this mapping is “determined on the basis of a number of principles and conditions which guarantee that the arguments are systematically assigned to the correct functions.” For instance, the predicate *izle* ‘watch’ consists of two core arguments: the experiencer, which is mapped to the grammatical function Subject in f-structure; and the theme, which is mapped to the grammatical function Object in f-structure. The structure of a sentence consists of all three levels mapping onto one another, which is a “parallel distribution, i.e. all of these forms exist at the same time and are linked (mapped) to each other by the various principles and conditions that regulate this linking” (Fabri, 2008, p.56). The relationship between the three structures of *Cocuk kurbagayi izliyor* is illustrated as follows:



**Figure 4.9:** Three parallel structures of LFG for *Cocuk kurbagayi izliyor*

#### 4.2 Non-linearity in PT

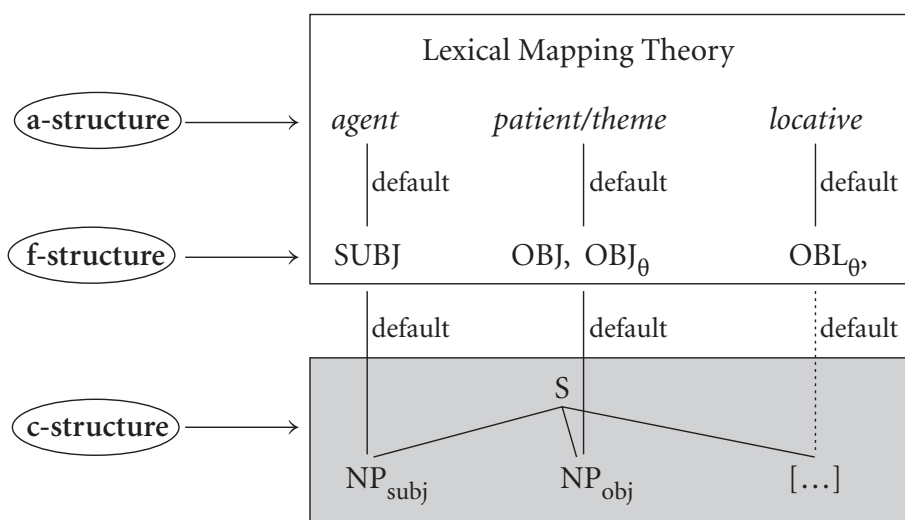
Besides feature unification which the original version of PT (Pienemann, 1998b) utilised, the theory's extended version (Pienemann et al., 2005) focuses on another key mechanism modelled using LFG: the non-linear mapping of arguments and constituents to grammatical functions. As explained above, LFG consists of three components: a-structure, f-structure and c-structure, which are mapped onto each other according to the universal principles based on linearity. Pienemann et al. (2005) propose that at earlier stages of development syntax is generated in a linear process where there is a one-to-one correspondence between a- and f-structure and between c- and f-structure without a need for language-specific processor and memory stores. This is illustrated as follows:

agent	patient	...	argument roles	→ a-structure
SUBJECT	OBJECT	...	grammatical functions	→ f-structure
NP <sub>SUBJ</sub>	NP <sub>OBJ</sub>	...	c-structure	→ constituents

**Figure 4.10:** Linear mapping between the a-, f- and c- structure (Pienemann et al. 2005, p.226)

### 4.2.1 The Unmarked Alignment Hypothesis

In PT, this process of linear mapping is explained by the Unmarked Alignment Hypothesis, which predicts that “learners will initially organise syntax by mapping the most prominent semantic role available onto the subject (i.e. the most prominent grammatical role). The structural expression of the subject, in turn, will occupy the most prominent linear position in c-structure, namely the initial position” (Pienemann et al., 2005, p.229).



**Figure 4.11:** One-to-one correspondences in Unmarked Alignment (Pienemann et al., 2005, p.230)

Thus, in the initial stages of language development, the mapping relation between a-, f- and c- structure is linear and fixed which constrains the generation of syntactic structures into canonical word order only. This process of producing the canonical order of the target language in early stages is then linear and does not require exchange of information or storage of this information. As the c-structure rules are generally language-specific, Pienemann et al. (2005, p.231) assert that “at the initial state c-structure is ‘flat’ (e.g., without VP) and the S-procedure as well as phrasal procedures are unable to act as linguistic memory stores for grammatical information because such information is language-specific.”

### 4.2.2 The Topic Hypothesis

The relation between a, f- and c-structure is not always linear and the complex mapping relations are generated as language development progresses, which according to Pienemann et al. (2005, p.223) results from following non-linear mapping mechanisms: (a) the non-canonical mapping of c- to f-structure, which is

“created by the addition of adjuncts to canonical structure and the assignment of discourse functions (FOC and TOP) to dislocated elements in c-structure”; and (b) the non-canonical mapping of a- to f-structure, which is “caused by exceptional lexical entries with intrinsic non-canonical a-structure (e.g. ‘receive’ or ‘please’) and non-default verb forms (e.g. passive, causative constructions).”

Falk (2001) notes that languages have different grammatical c-structures and each language has its own rules defining grammatical and well-formed c-structures. Bresnan (2001) refers to languages as having endocentric organisation and lexocentric organisation. In endocentric organisation grammatical functions are encoded in c-structure configurations (word order), and in lexocentric organisation grammatical functions are encoded by lexical features such as Case and agreement. However, some languages may have a combination of endocentric and lexocentric organisation. It is argued that since the configurational organisations are language-specific, language learner “does not know in advance what the relevant canonical mapping of the target language will be, nor what its specific ‘mix’ of syntactic-morphological realisation of functional and argument structure will entail” (Pienemann et al., 2005, p.209).

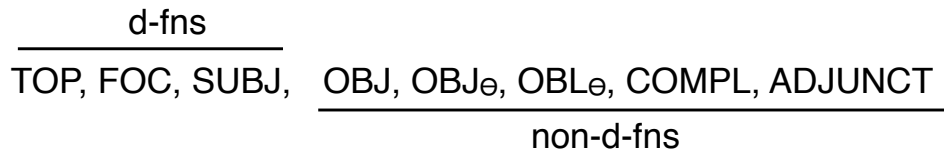
As mentioned above, the first deviation from linear mapping occurs with the addition of discourse functions to canonical structure. Bresnan (2001, p.94-98) classifies grammatical functions into two main categories. First category distinguishes the argument functions (*a-fns*) from the non-argument functions illustrated as follows:

(4.6)

$\frac{\text{TOP, FOC,}}{\text{non-a-fns}}$	$\frac{\text{a-fns}}{\text{SUBJ, OBJ, OBJ}_\theta, \text{OBL}_\theta, \text{COMPL}}$	$\frac{\text{ADJUNCT}}{\text{non-a-fns}}$
---	--	---

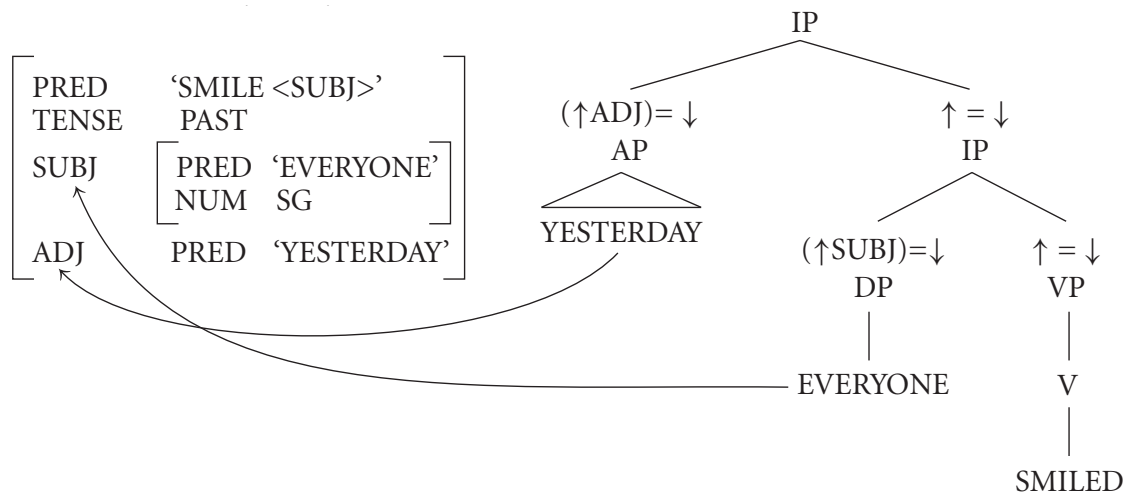
The next distinction is between the grammaticalised discourse functions (d-fns) and non-discourse functions illustrated as follows:

(4.7)



According to these two classifications, the Subject is the only function that has the property of being both an argument function and a grammaticalised discourse function, and it is generally identified as the default TOP (topic) of the clause (Bresnan, 2001, p.98). In terms of mapping procedures, Pienemann et al. (2005, p.210-211) argue that there are two principles that license the relation between c-structure and f-structure: (a) “specifiers of functional projections are grammaticalised discourse markers (i.e. TOP, FOC or SUBJ)”; and (b) “constituents adjoined to XP are one of the non-argument functions TOP, FOC or ADJUNCT.” As mentioned above, by the Unmarked Alignment Hypothesis the Subject is always identified with the initial NP in the sentence, and one of the non-linear mappings results from adding adjuncts to the initial position in c-structure while the canonical word order remains fixed. This is illustrated by Pienemann et al. (2005, p.233) with ‘*Yesterday everyone smiled*’ as follows:

(4.8) *Yesterday everyone smiled*



**Figure 4.12:** Non-Linear Mapping by the addition of ADJ (Pienemann et al., 2005, p.233)

In this example, the c-structure is mapped to f-structure in a non-linear fashion as the initial position in the sentence is occupied by a non-subject, namely an Adjunct. This progress from linear mapping to non-linear mapping between c-structure and f-structure is captured by the Topic Hypothesis which Pienemann et al. (2005, p.239) formulates as “In [target] language acquisition, learners will initially not differentiate between SUBJ and TOP. The addition of an XP to a canonical string will trigger a differentiation of TOP and SUBJ which first extends to non-arguments and successively to [core]-arguments thus causing further structural consequences.” Figure 4.13 illustrates these mapping principles and their structural outcomes.

Discourse principle	c- to f- mapping	structural outcomes
Topicalisation of core arguments	TOP = OBJ	The TOP function is assigned to a <i>core</i> argument other than SUBJ.
↑	↑	↑
XP adjunction	TOP = ADJ	Initial constituent is a circumstantial adjunct or a FOCUS WH-word. TOPIC is differentiated from SUBJECT
↑	↑	↑
Canonical Order	SUBJ = default TOP	TOPIC and SUBJECT are not differentiated.

**Figure 4.13:** The Topic Hypothesis (Pienemann et al., 2005, p.239)

According to this figure, in the early stages of language development learners rely on canonical word order in the target language where the sentence-initial position is occupied by the Subject which is identified with TOP. The first deviation from linear mapping is introducing an ADJUNCT to the sentence-initial position and assigning it discourse functions TOPIC or FOCUS without being able to change the canonical word order. At the next developmental stage, the learner is able to assign the TOPIC function to a core argument other than SUBJECT which requires deviation from the canonical order and thus generates a non-linear structure.

### **4.2.3 The Lexical Mapping Hypothesis**

The second type of deviation from linear mapping concerns the mapping from a- to f-structure. In PT, this type of non-linearity is handled by the Lexical

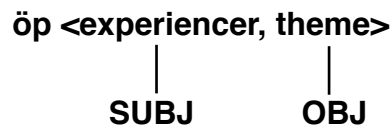
Mapping Hypothesis, which is “the counterpart to the Topic Hypothesis, and it allows for predictions on how lexical mapping develops from the constraints of the Unmarked Alignment Hypothesis to more target-like linguistic variability and expressiveness facilitated by the non-canonical mapping principles of the target language” (Pienemann et al., 2005, p.245). The Lexical Mapping Hypothesis, identifying the developmental stages according to the lexical structure of predicates and their relationship with their arguments is based on LFG’s Lexical Mapping Theory (Bresnan, 2001), a systematical explanation of the relationship between the syntactic realisations of the arguments and their predicates. Falk (2001) proposes that arguments are characterised according to their roles in the predicate’s meaning, which are known as thematic roles labeled such as Agent, Patient, Theme, Goal, Source, Experiencer etc. for characterisation of conceptual roles. According to Bresnan (2001, p.307), the relative prominence of these roles to the predicate indicates a universal thematic hierarchy illustrated as follows:

***Thematic Hierarchy:***

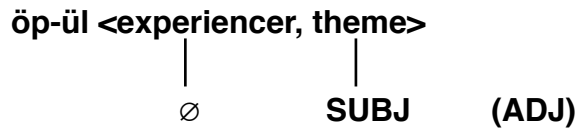
agent > beneficiary > experiencer/goal > instrument > patient/theme > locative

Lexical Mapping Theory provides the principles of the mapping from these thematic roles to syntax. From a PT perspective, at the initial stages of development, grammatical functions are mapped to argument roles in a canonical fashion, which constitutes a linear mapping from a-structure to f-structure. The non-linear mapping of a- to f- structure is “caused by exceptional lexical entries with intrinsic non-canonical a-structure (e.g. ‘receive’ or ‘please’) and non-default verb forms (e.g. passive, causative constructions). In the latter case, constituent structure may be canonical while the a- to f- structure mapping is non-canonical” (Pienemann et al., 2005, p.223) The following examples illustrate the difference between canonical and non-canonical mappings in active and passive alterations in Turkish.

(4.9)	Çocuk	kiz-i	öp-üyor.
	Boy	girl-ACC	kiss-PRE
	‘The boy kisses the girl’		



(4.10) Kiz (çocuk tarafından) öp-ül-üyor.  
 Girl (boy by) kiss-PASS-PRE  
 'The girl is kissed by the boy'



In the active sentence (4.9), the mapping from a- to f-structure is linear with the thematic roles are mapped to their most prominent grammatical functions. However, in the passive sentence (4.10) this mapping relationship is re-arranged by promoting the OBJ of the active sentence to the SUBJ of the passive sentence, which leaves the experiencer role empty and makes it realised optionally as ADJ. There are other non-linear mappings from a- to f-structure that are realised by exceptional lexical entries or causative constructions; however, these structures will not be presented here since they are irrelevant to the focus of this study. The following figure illustrates the Lexical Mapping Hypothesis in terms of the developmental stages of non-linear mapping of a-structure to f-structure.

a- to f- structure mapping	Structural outcomes
Non-default, complex mapping.	Complex predicates e.g. Causative (in Romance languages, Japanese, etc.), raising, light verbs.
↑	↑
Non-default mapping. (single clause)	Passive Exceptional verbs
↑	↑
Default mapping, ie. Most prominent thematic role is mapped onto SUBJ.	Canonical Order

**Figure 4.14:** The Lexical Mapping Hypothesis (Pienemann et al., 2005, p.246)

As is demonstrated, Processability Theory (Pienemann, 1998a,b; Pienemann et al., 2005) provides an explicit and typologically plausible explanation for the role of processing procedures in language acquisition. The modular design of PT is able to address the two fundamental issues of a theory of language acquisition, namely developmental problem and logical problem (Pienemann, 2005). While the 1998 version of PT focused on the developmental problem and examined the acquisition of morphosyntactic structures, the extended version can handle the logical problem too. This is achieved by operationalising PT on the formalisms of Lexical-Functional Grammar (Bresnan, 2001), which is a typologically and psychologically plausible formal theory of grammar that has the power to model the generation of linguistic information using feature unification and mapping principles. The following table presents a summary of language development through the processability hierarchy as discussed in this chapter.

**Table 4.2:** Processability hierarchy and implicational order of procedures (adapted from Pienemann, 2011, p.48)

Stage	Processing procedures	Mapping outcomes	Topic Hypothesis	Lexical Mapping Hypothesis	Time 1	Time 2	Time 3	Time 4	Time 5
5	Sub. clause procedure	Main and sub. clause		Complex predicates	-	-	-	-	+
4	Sentence procedure	Inter-phrasal information exchange	Topicalisation of core arguments	Passive	-	-	-	+	+
3	Phrasal procedure	Phrasal information exchange	XP-adjunction	Exceptional verbs	-	-	+	+	+
2	Category procedure	Lexical morphemes	Canonical order	Canonical order	-	+	+	+	+
1	Word/lemma access	“words”			+	+	+	+	+

In Table 4.2, “Processing procedures” in the second column are based on Levelt’s (1989) model of language generation. “Mapping outcomes” in the next column represent the hierarchy of morphosyntactic processes in language acquisition. The column “Topic Hypothesis” lists the hierarchy of the mapping of c-structure to f-structure and predicts the development of non-linear mapping of TOPIC function to constituents other than Subject when it is no longer in

sentence-initial position. The “Lexical Mapping Hypothesis” column represents the developmental sequence of the mapping of a-structure to f-structure and predicts the development of non-linear mapping from a-structure to f-structure. The Unmarked Alignment Hypothesis, which is not represented in the table, predicts that language development relies on canonical word order at the early stage of acquisition (Stage 2) before the ability to generate non-linear mappings from c-structure to f-structure and from a-structure to f-structure. The thick vertical bars denote that the relationship between these grammatical phenomena and the hierarchy of processing procedures is still unclear (Pienemann, 2011).

Overall, PT (Pienemann, 1998b; Pienemann et al., 2005) predicts that language acquisition is constrained by processability of linguistic information. The production of linguistic information is possible only if the necessary grammatical procedural skills are available to the learner. These procedural skills can be analysed in an implicational hierarchical order of developmental stages, in which every stage is a prerequisite for the the next one. The predictive power of PT comes from the fact that the theory is built on the universal hierarchy of cognitive processing procedures that can be applied to any human language. The processability of linguistic information within this hierarchy is based on Lexical-Function Grammar formalism (Bresnan, 2001). In the next chapter, I will present an LFG analysis of Turkish grammatical structures and their hierarchical relationship within the PT formalism.

## **Chapter 5. A Processability Approach to Acquisition of Turkish Morphosyntactic System**

This section aims to present a novel application of PT's processing procedures of feature unification and mapping principles to a number of Turkish morphosyntactic features and constructions to hypothesise a developmental hierarchy. Of the grammatical features and constructions of Turkish the following will be discussed in this study: case suffixes, tense suffixes, person suffixes, pro-drop, agreement in possessive noun phrases, agreement between the finite and non-finite verb in verb complements, word order rules, the passive and relative clauses. As discussed above in Chapter 2, many of these structures have been found to be vulnerable or incomplete in heritage language grammars. Furthermore, these represent the overall linguistic profile of Turkish grammar from basic nominal and verbal morphology to complex syntax like passive and relative clauses. Including passive and relative clauses also forms a basis for testing the typological plausibility of PT itself, which Keßler and Liebner (2011) referred as the objective for further research on the theoretical development of PT.

So far the only study that has looked at the acquisition of Turkish from a PT perspective is by Özdemir (2004) who developed a Turkish hierarchy and used the existing PT hierarchies for English and German in a comparative study of trilingual language development in Turkish-German children learning English. The hypothesised processing hierarchy of Turkish in Özdemir's (2004) study is concerned with the morphological development based on the early version of PT (Pienemann, 1998b). Although there are similarities between Özdemir's (2004) hypothesised hierarchy and the one I propose here, the main difference is how the grammatical structures are analysed within the LFG and PT frameworks. In Özdemir's study, the linguistic explanation of grammatical forms in the hierarchy focuses only on feature unification within the predictions of PT's original version (Pienemann, 1998b), and some areas are left untouched (i.e., word order and non-linear mapping). In this study, however, a wider area of Turkish grammar is accounted for in the hypothesised developmental hierarchy of morphosyntactic structures by utilising PT's extended version (Pienemann et al., 2005) to explain the development of grammatical structures according to

feature unification within and across the phrasal boundaries, and the developmental deviations from linear mapping of c-structure to f-structure and a-structure to f-structure.

These structures and their corresponding place in the PT processing hierarchy are given in Table 5.1.

**Table 5.1.** Processing procedures in PT and corresponding Turkish structures

Stage	Processing procedures	Level of information exchange	Topic Hypothesis (Syntax)	Morphosyntax	
				Verbal	Nominal
5	Subordinate clause procedure	Inter-clausal information		Relative clause (long-distance dependency)	
4	S-procedure	Inter-phrasal information	Non-canonical mapping (OSV) TOPIC = OBJ	Passive (*ST)	
3	Phrasal procedure	Phrasal information	Adjunct + Canonical mapping (SOV) TOPIC = ADJ	Verb Comp.	Genitive-Possessive
2	Category procedure	Lexical morphemes	Canonical order: SOV Pro-drop TOPIC = SUBJ	Passive (*NST) Tense Person	Case Plural
1	Word-lemma	'words'	Single words, formulae	--	--

\*NST = Non-suppressed thematic role

\*ST = Suppressed thematic role

## 5.1 Lexical-Functional Grammar Analysis of Various Turkish Structures

### 5.1.1 Turkish Grammar in a Nutshell

Turkish is a language which has a rich agglutinative morphology; that is, sequences of inflectional and derivational morphemes attach to a root in a predefined order (Kornfilt, 1997; Oflazer, 1994). According to Xanthos et al. (2011) Turkish morphology is by far the 'richest' of the nine languages they

studied (French, Dutch, German, Russian, Croatian, Greek, Turkish, Finnish and Yucatec), considerably richer than the other two non-Indo-European languages (Finnish and Yucatec). Turkish is also considered to have a relatively free constituent order with subject-object-verb (SOV) as the unmarked word order as in the following example:

(5.1) Kiz oglan-i öp-tü.  
 Girl boy-ACC kiss-PAST-3.SG  
 ‘The girl kissed the boy.’

However, as we shall see below, there are some restrictions on the constituent order in the main clausal level and more restrictions in the clausal level (Çetinoglu, 2009; Erguvanli, 1984; Oflazer, 1994; Underhill, 1976). From a morphological view, it is a nominative-accusative language with six nominal cases, namely nominative, accusative, dative, locative, ablative and genitive (Oflazer et al., 1994). The inflectional verbal affixes mark negation, modality, tense/aspect, and person (Ketrez, 1999). As seen in examples (5.2) and (5.3), Turkish is also a head-final language where modifiers and specifiers are always placed before heads (Erguvanli, 1984; Göcmen et al., 1995; Knetch, 1985).

(5.2) ari-lar-in ev-i  
 Bee-PLU-GEN house-POSS  
 ‘bee’s house’

(5.3) kadin-i gör-en adam  
 woman-ACC see-S.REL man  
 ‘the man who sees the woman’

Syntactically, Turkish is a pro-drop language as seen in the following examples.

(5.4) Biz okul-a git-ti-k.  
 We school-DAT go-PAST-1.PLU  
 ‘We went to the school.’

(5.5) Okul-a git-ti-k.  
 house-DAT go-PAST-1.PLU  
 ‘We went to the school.’

As we shall see in detail in section 5.2, both subject and object can be dropped, and subjects and objects are overtly used only for contrast, emphasis, or other marked discourse purposes (Çagrı, 2005).

The agglutinative nature of Turkish is characterised by highly consistent grammatical regularity. This enables a single Turkish verb to carry a number of suffixes to express the meaning of a full clauses in languages like English, which is exemplified by Ekmekci (1982) as follows:

(5.6) Görev-len-dir-e-me-dik-ler-imiz-den mi-siniz?

task- verb forming suffix - CAUS - ABIL - NEG - NOM - PLU -  
POSS.1PLU - ABL - Q.MARKER - 2PLU

‘Are you among those whom we were unable to assign a position to?’

The basic verbal morphology and case marking system of Turkish exhibits highly regular and clear one-to-one relationship between the surface forms and their meanings (Slobin, 1986). This clear and regular mapping system eases the learning of grammatical morphology at earlier ages than have been reported for children learning Indo-European languages (Aksu-Koç & Slobin, 1985; Batman-Ratyosyan 2004; Xanthos et al., 2010). However, there are some exceptions which mainly result from semantic complexity of certain morphemes and clausal subordination. For instance, the evidentiality morpheme ‘-miş’ has two functions: alternative to past tense ‘-di’ for indirect experience and perfective aspect (Slobin & Askı, 1982). The use of the either morpheme depends on the ability to make a semantic distinction between direct and indirect experiences depending on the discourse-pragmatic context, which follows the child’s cognitive development (Aksu-Koç, 1988; Öztürk & Papafragou, 2008; Slobin & Aksu, 1982). Similarly, in their discussion of the Turkish aorist morpheme ‘-ir’, which marks aspect and modality with various semantic functions such as the expression of habituality, possibility, and inquiry, Aksu-Koç and Slobin (1985) argue that the learning of this morpheme lags behind the others due to lack of one-to-one relationship between the form and function. Despite these exceptions, studies have shown that the basic nominal and verbal morphology is acquired before the age of 2 (Aksu-Koç; 1988, 1994; 2010; Ketrez, 1999; Küntay & Slobin, 1999; Slobin, 1979, 1982; Topbas et al.,

1997; van der Heijden, 1997; Xanthos et al., 2010). By age 2 Turkish children have analysed suffixes and their roots and that “added morphemes provide an interpretational semantic function in context” (Aksu-Koç & Slobin, 1985, p.847).

On the clausal level, relative clauses can be seen as another exception due to their non-transparent and variable forms of subordination in Turkish (Slobin, 1986). As illustrated below in example (5.7a) and (5.7b), Aksu-Koç and Slobin (1985) argue that the late emergence of Turkish relative clause results from the deformation of the embedded clause, which loses the finite verb and normal case inflections of a canonical main clause with subject and non-subject relative clauses requiring different morphemes.

(5.7a) Çocuk            kopeğ-i            yıka-di.  
Child                dog-ACC           wash-PAST-3.SG  
‘The child washed the dog.’

(5.7b) kopeğ-i            yıka-yan            çocuk  
dog-ACC            wash-S.REL       child  
‘The child who washed/is washing the dog’

Compared to one-to-one form meaning relationship in basic verbal and nominal morphology, the morpheme in relative clause does not make an explicit semantic relationship between the relative clause and the head noun; instead, the interpretation is mainly based on the lexical semantics of the head noun (Haig & Braun, 1999).

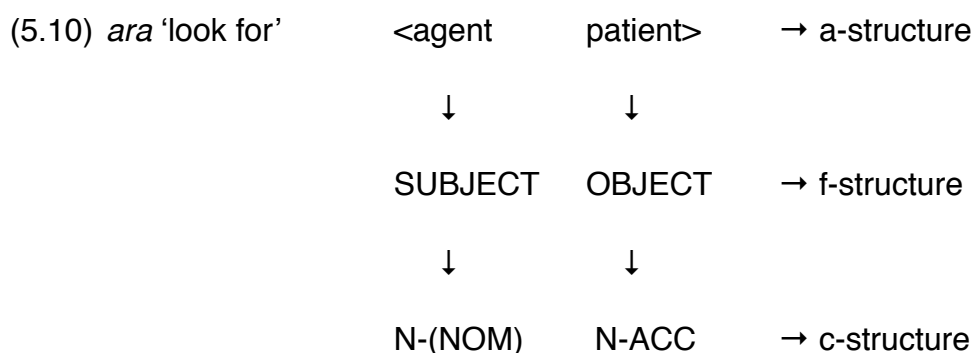
In this study I will examine language development by focusing on the acquisition order of the grammatical forms within the LFG formalism in terms of feature unification and mapping principles.

### **5.1.2 Basic Syntactic Configuration**

As stated above, Turkish can be characterised as a free word order language with SOV as its canonical order. The free word order is enabled by morphological markings on the constituents that signal the constituents’ roles

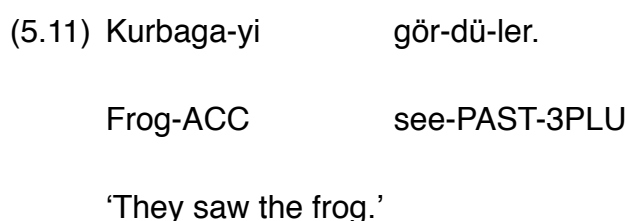


its specificity (Enc, 1991). A complete clause consists of a finite verb with the TENSE feature (Çetinoglu & Oflazer, 2006). According to Pienemann (1998b), sentences such as (12) represent a direct mapping from a-structure onto f-structure without any arbitrariness since morphemes clearly mark the semantic roles.



No exchange of information is required to produce such sentences since the morphological markers of semantic roles are activated by the conceptual structure (Pienemann, 1998b, p.84). As discussed above, in the current version of PT (Pienemann et al, 2005, p.229), this phenomenon is formalised by the Unmarked Alignment Hypothesis, which predicts that learners “will initially organise syntax by mapping the most prominent semantic role available onto the subject (i.e. the most prominent grammatical role). The structural expression of the subject, in turn, will occupy the most prominent linear position in c-structure, namely the initial position.” For this reason, canonical sentences are predicted to be acquired at Stage 2.

For the nominal morphology, Turkish nouns are marked for case and plural, and for the verbal morphology, the verb is marked for person, tense/aspect, modality, voice and negation. In example (5.11), while the noun *kurbaga* ‘frog’ is marked with accusative case (ACC), the verb is marked with tense and person as well as carrying pro-drop feature.



Similarly, in (5.12) the noun *agaç* ‘tree’ is marked with ablative case (ABL), and the verb *düs* ‘fall’ has tense and person markers with pro-drop feature.

(5.12) *Agaç-tan düs-tü-ø.*  
 Tree-ABL fall-PAST-3SG  
 ‘S/he fell from the tree’

In (5.13), the noun *çizme* ‘boot’ is marked with plural (PLU) and accusative case (ACC), while the verb is marked with tense and person.

(5.13) *Çizme-ler-i giy-di-m.*  
 Boot-PLU-ACC wear-PAST-1SG  
 ‘I put my boots on.’

The verbs *gör* ‘see’, *düs* ‘fall’ and *giy* ‘wear’ exhibit the features PERS, NUM and TENSE by the following suffixes:

(5.14) *ari-yor-lar* V PRED < *ara* ‘search’ (SUBJ, OBJ)>  
 (↑ASP) = CONT  
 (↑TENSE) = PRE  
 (↑PERS) = 3  
 (↑NUM) = PLU

(5.15) *düs-tü* V PRED < *düs* ‘fall’ (SUBJ, (OBL))>  
 (↑TENSE) = PAST  
 (↑PERS) = 3  
 (↑NUM) = SG

(5.16) *giy-di-m* V PRED < *giy* ‘wear’ (SUBJ, OBJ) >  
 (↑NUM) = SING  
 (↑PERS) = 1  
 (↑NUM) = SG

The nouns *kurbaga* 'frog', *agaç* 'tree' and *çizme* 'boot' exhibit features of CASE and NUM by the following suffixes:

(5.17) *kurbaga-yi* N PRED < *kurbaga* 'frog' >

(↑CASE) = ACC

(5.18) *agaç-tan* N PRED < *agaç* 'tree' >

(↑CASE) = ABL

(5.19) *çizme-ler-i* N PRED < *çizme* 'boot' >

(↑NUM) = PLU

(↑CASE) = ACC

From a PT perspective, these morphological markings of case and plural are examples of lexical morphemes since no grammatical information has to agree with another constituent with the NP (Pienemann, 1998b). Similarly, functional suffixes with the value of PRE and PAST on the verb are examples of lexical morphology since the suffix and the root are within the same lexical entry, which means no grammatical information needs to be unified across constituents or phrases (Pienemann & Håkansson, 1999). As described above, not all tense morphology suffixes on verbs have a regular and one-to-one form-meaning relationship (i.e., *-di*, *-mis*, *-ir*). However, in this study the focus is on the level of the exchange of grammatical information across the constituents. Thus, whether a speaker chooses to produce '*-di*' or '*-mis*' or '*-ir*' is irrelevant for the purpose of this study since these are all identified as Tense forms. For this reason, case and plural marking on the noun and tense marking on the verb are predicted to be acquired at Stage 2.

### **5.1.3 Pro-Drop feature of Turkish in LFG**

In Turkish, subject of a sentence can be dropped as the information the subject carries can be realised in the verb by agreement markers denoting the person (Erguvanli, 1984; Lewis, 2000). This type of behaviour is called pro-drop when the grammatical function of a non-overt syntactic argument (e.g., subject) is interpreted pronominally by an affix on the head (e.g., verb) (Strunk, 2005). Similarly, Bresnan (2001, p.117) suggests that pro-drop refers to "the functional

specification of a pronominal argument by a head; this entails the absence of the structural expression of the pronoun as a syntactic NP or DP.”

In sentence (5.20a), the subject affix *-(u)m* agrees with the overt pronoun *ben* ‘I’. But in sentence (5.20b) the same affix can provide a pronominal interpretation for the missing complement ‘subject’.

(5.20a)	Ben	yürü-yor-(u)m.	(5.20b)	Yürü-yor-(u)m.
	I	walk-PRE-1SG		walk-PRE-1SG
		‘I am walking’		‘I am waking’

The lexical entry for sentence (24) is represented as follows:

(5.21)	<i>yürüyorum</i>	V	(↑ PRED) = <i>yürü</i> ‘walk’ <(↑ SUBJ (OBL))>
			(↑ SUBJ PRED) = ‘PRO’
			(↑ SUBJ NUM) = SG
			(↑ SUBJ PERS) = 1

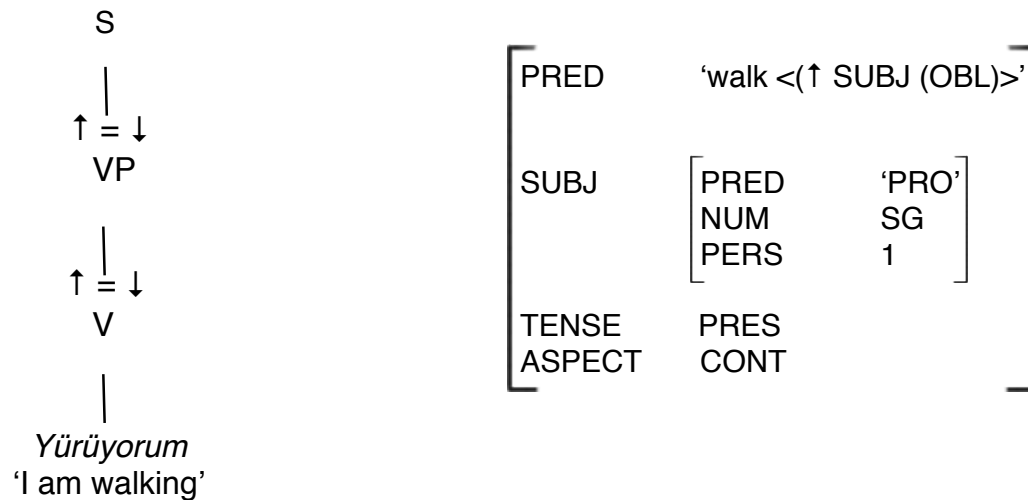
Based on the LFG formalism, the lexical entry for the affix *-(u)m* in the example (5.20b) is as illustrated below in (27).

(5.22)	-m	(↑SUBJ) = ↓
		(↓PRED) = ‘PRO’
		(↓NUM) = SING
		(↓PERS) = 1

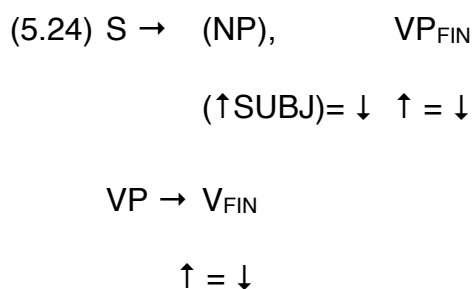
In order to satisfy the Completeness Condition, the agreement suffix specifies the PRED value for SUBJ, whose ‘PRO’ feature is optional (SUBJ PRED = ‘PRO’) and can only be used when lexical Subject is not overt; otherwise, two PRED features and two PRED values, one from the lexical Subject and one realised by the verb, would violate the unification rule (Charters, 2012; Dalrymple, 2001). Moreover, Falk (2001) proposes that unexpressed pronouns are not represented at c-structure in LFG analysis. This optional PRED “pro-drop” value allows for the absence of overt phrasal arguments (e.g., Subject) and enables a Turkish sentence to consist of a verb only without any overt

subject or object phrases present at c-structure (Dalrymple, 2001, p.128). As developed by Strunk (2005, p.6), (5.23) illustrates c-structure and f-structure for the sentence *Yürüyorum* ‘I am walking’:

(5.23) c-structure and f-structure for *Yürüyorum*



In (5.23), the personal affix on the head realises the pro-drop feature and provides a pronominal interpretation since there is no overt argument phrase. According to this analysis of pro-drop value in Turkish, the general phrase structure rule for the syntactic order of Turkish sentences like (5.23) will look as follows:



To account for the pro-drop phenomenon in Turkish, the “feature merging process” proposed by Vigliocco et al. (1996) will be adopted. This approach has been adopted in the PT analysis of pro-drop in Italian (Di Biase & Kawaguchi, 2002) and in Arabic (Mansouri, 2005). In Lexical Functional Grammar this feature merging process is managed through the ‘unification’ of features found in lexical entries; merging can be managed by unifying morphosyntactic features located in the relevant lexical entries.

In the above example, the subject does not have a syntactic category in the constituent structure. However, the affix ‘-m’ on the verb encodes SUBJ features such as NUMBER=SING and PERSON=1 without “unifying them to an overt subject, or to an obligatory subject slot in c-structure - which may create the ‘illusion’ of subject-verb agreement” (Di Biase, 2007, p.7). Since there is no requirement for grammatical information exchange between the morpheme and other elements in the sentence, it is predicted within PT framework that pro-drop operation and person marking on the verb are acquired at Stage 2.

#### **5.1.4 Genitive-Possessive NP Construction**

In Turkish, a pronominal possessor is usually expressed by a possessive pronoun preceding a possessed NP (Göçmen et al., 1995):

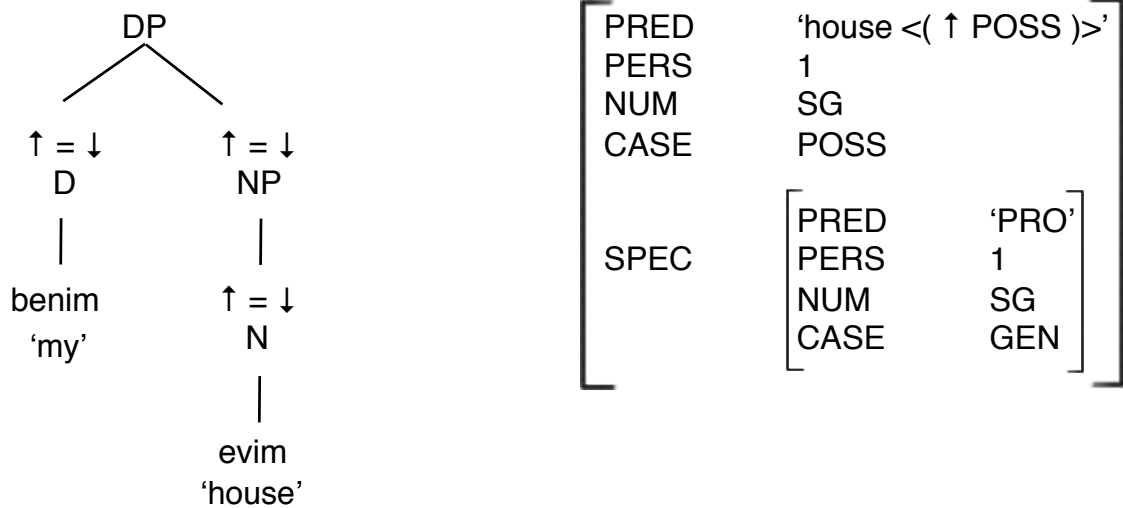
(5.25) ben-im            ev-im  
           I-GEN            house-POSS.1SG  
           ‘my house’

(5.26) o-nun            ev-i  
           s/he-GEN        house-POSS.3SG  
           ‘his/her house’

(5.27) biz-im            ev-imiz  
           we-GEN            house-POSS.3PLU  
           ‘our house’

An NP in genitive case modifies the head NP where the modifying NP functions as a possessive specifier, namely SPEC POSS, and possessive pronoun agrees with the possessed NP in person and case (Çetinoglu, 2009). Strunk (2005, p.7) notes that possessive pronouns and demonstratives occur in the same syntactic position and thus possessive pronouns can be treated as determiner and analysed as a D co-head of the possessed NP. (5.28) gives the c-structure and the f-structure for the simple NP in (5.25).

(5.28) c-structure and the f-structure for the NP *benim evim*



Similar to subject pronouns, possessive pronouns in Turkish also have the optional 'PRO' feature which means they can be dropped as the possessiveness can be realised on the noun by suffixation, which is then regarded as a lexical morpheme without an grammatical information exchange across constituents (Stage 2). This can be seen in the following example:

(5.29) *ev-im*

house-POSS.1SG

'my house'

However, if there is a compound noun construction, then the possessive noun must be marked with GEN and the possessed noun with POSS (Çetinoglu, 2009; Kornfilt, 1997), as in:

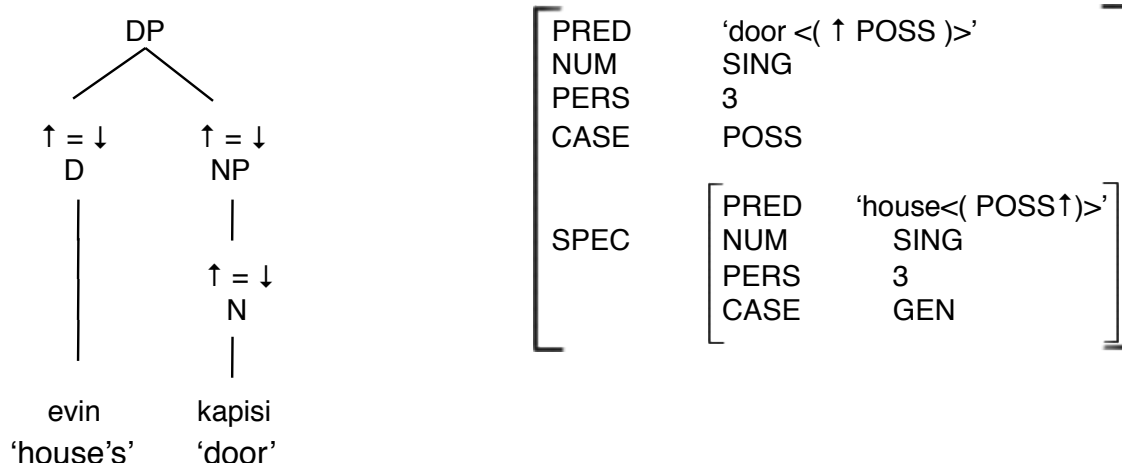
(5.30) *Ev-in kapi-(s)i*

House-GEN door-POSS

'house's door'

Based on Strunk's (2005, p.10-13) analysis of possessive construction; (5.31) give the c-structure and the f-structure for the simple NP in (5.30) respectively:

(5.31) c-structure and the f-structure for the NP *evin kapisi*



As proposed by Falk (2001, p.76), this type of possessive construction involves a constraining equation since the possessor must be marked with the genitive case marker, which is distinguished notationally by subscripting the letter 'c' to the equal sign. Thus, following Falk's (2001, p.76) phrase structure rule for possessor in DP, the phrase structure rule for DP (5.30) is as follows:

(5.32) DP → D NP

(↑POSS)=↓                      ↑ = ↓

(↓CASE)=<sub>c</sub> GEN            (↓CASE)= POSS

According to this rule, while constructing a genitive-possessive NP structure, grammatical information exchange is required between the head noun and its complement within the phrase. This illustrates phrasal morphology in Turkish. Because grammatical information is unified between two constituents within the NP, it is hypothesised to be acquired at Stage 3 (Phrasal Procedure).

### 5.1.5 Verb Complements

A similar use of constraining involves the complement in VP. Each main verb can take a verbal complement, the function of which is called XCOMP (Dalrymple, 2001). For instance, in equi verbs, the main clause SUBJ is a thematic argument of the verb, and is also the SUBJ of the complement. Bresnan (2001, p.270) notes that in such constructions, a predicate complement is dependent on another argument of the head that serves as its

subject of predication, and predicate complements in different languages have morphosyntactic properties that establish their grammatical relationship with the argument. This can be seen in example (5.33):

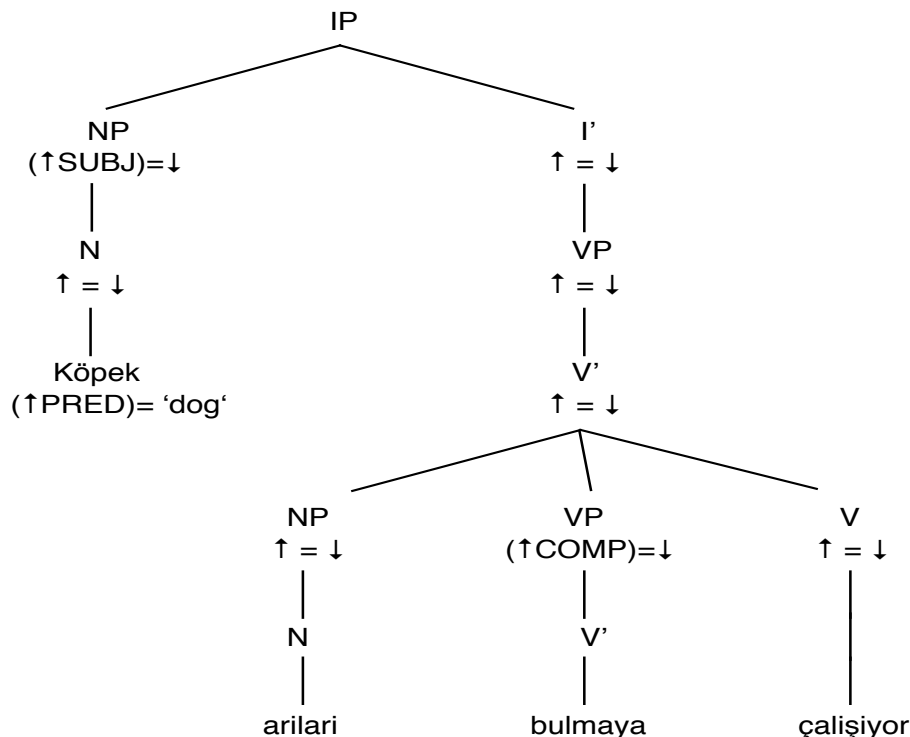
- (5.33) Köpek            ari-lar-i            bul-ma-(y)a            çalış-ıyor.  
 Dog            bee-PLU-ACC            find-INF-DAT            try-PRE-(3SG)  
 ‘The dog is trying to find the bees.’

In (5.33), the SUBJ of the verb *çalış-* (*‘try’*) functionally controls the SUBJ of the verb *bul-* (*‘find’*) (Bresnan, 2001; Dalrymple, 2001; Falk, 2001). Based on the lexical entry for the verb “try” in English proposed by Dalrymple (2001, p.327), the lexical entry for the Turkish verb *çalış-* (*‘try’*) is as follows:

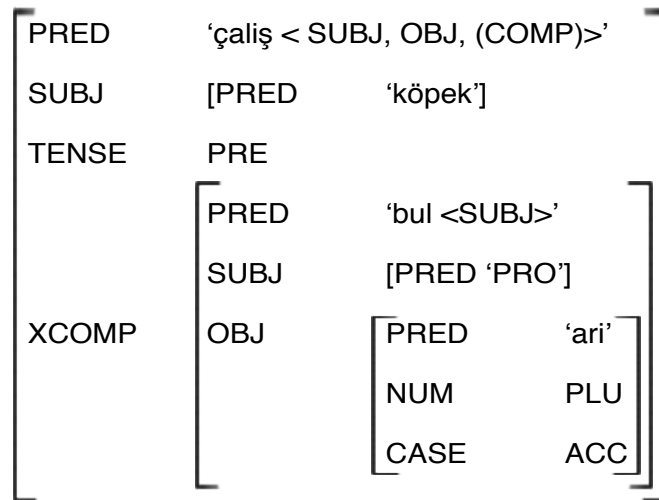
- (5.34) çalış- V      (↑PRED) = ‘çalış <SUBJ, XCOMP>’  
 (↑XCOMP SUBJ PRE) = ‘PRO’

The second line in the lexical entry specifies the pronominal SUBJ for the subordinate XCOMP. Following Dalrymple’s (2001, p.328) analysis of equi verbs and control in English, (5.35a) and (5.35b) illustrate c-structure and f-structure of the sentence (5.33) respectively:

- (5.35a) c-structure for *Köpek arilari bulmaya çalışiyor*



(5.35b) f-structure for *Köpek arilari bulmaya çalışıyor*



Falk (2001, p.140-141) has analysed infinitive as a complementiser, which disallows the feature TENSE as in the construction of equi verb phrase in (5.33) and proposes the following phrase structure rule that also applies to the VP in (5.33):

$$\begin{aligned}
 (5.36) \quad VP &\rightarrow \quad XP \quad , \quad V \\
 &\quad (\uparrow XCOMP)=\downarrow \quad \quad \quad \uparrow=\downarrow \\
 &\quad \neg (\downarrow TENSE)_c
 \end{aligned}$$

According to this rule, lexical entries for *bulmaya çalışıyor* ‘is trying to find’ are listed as follows:

- (5.37) bul-ma-ya    V    PRED < bul ‘find’ (XCOMP, SUBJ) >  
 $\neg (\downarrow TENSE)_c$   
 INF = +  
 SUBJ = XCOMP SUBJ  
 CASE = DAT
- çalış-ıyor    v    PRED < çalış ‘try’ (SUBJ, XCOMP)  
 SUBJ = XCOMP SUBJ  
 TENSE = PRE  
 PERS = 3  
 NUM = SG

According to Pienemann and Håkansson (1999), the constraining equation  $\neg (\downarrow \text{TENSE})_C$  under the lexical entry for *bul* ‘find’ ensures that the complement remains tenseless, which is functionally forced by the verb *çalis* ‘try’. Since these grammatical features are matched between the two verbs within the verb phrase, “this feature unification defines the underlying process as phrasal morphology” (Pienemann & Håkansson, 1999, p.403), and thus is predicted to be acquired at Stage 3.

### **5.1.6 Passive**

Within the framework of LFG, the mapping relationships between grammatical functions and their characteristic thematic roles are systematically explained by means of Lexical Mapping Theory (Bresnan, 2001; Bresnan & Kanerva, 1989). Falk (2001, pp.96-97) notes that Lexical Mapping Theory initially addresses a(argument)-structure and thus is about the syntactic realisation of the arguments of a predicate as it “maps from a semantic/conceptual representation of thematic roles [ $\theta$ -structure] ... to a syntactic representation of grammatical functions [f-structure], via an intermediate lexical representation [a-structure].” As mentioned earlier in the previous chapter, these thematic roles are labels such as Agent, Patient, Theme, Goal, Source, Experiencer, etc. and form a thematic hierarchy according to their relative prominence from left-to-right order:

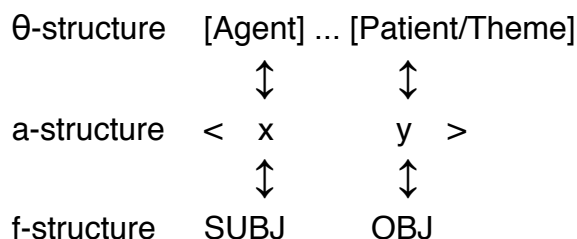
#### ***Thematic Hierarchy:***

agent > beneficiary > experiencer/goal > instrument > patient/theme > locative

(Bresnan, 2001, p.307)

A-structure represents “the syntactic argument-taking properties of a lexical item” (Falk, 2001, p.100) and plays the role of an interface between the thematic structure and f-structure. The core participants of an event that are represented in  $\theta$ -structure by thematic roles are assigned lexically by the meaning of the verb (Fabri, 2008, p.53). For instance, in a sentence like *Adam ineg-i it-iyor* ‘man cow-ACC push-PRE-3SG’ = ‘The man is pushing the cow’, there are two core participants: the agent as the “pusher” and the theme as the object “pushed”. This mapping relationship proposed by Lexical Mapping Theory can be illustrated as follows:

(5.37) *it* 'push'



Thus the role of a-structure is systematically defining “what grammatical functions each argument can be potentially mapped to” (Falk, 2001, p.101). Within Lexical Mapping Theory, these grammatical functions are decomposed analytically into distinctive features, and intrinsic syntactic features are associated with logical arguments (Neidle, 1996). The four primary (or core) grammatical functions (SUBJ, OBJ, OBJθ and OBLθ) are decomposed into two binary features: [±r] (restricted) and [±o] (objective), which are associated with arguments according to universal mapping principles as shown in Table 5.2:

**Table 5.2:** Feature Decomposition of Argument Functions (adapted from Bresnan, 2001, p.308)

	Non-objective [-o]	Objective [+o]
Thematically unrestricted [-r]	SUBJ	OBJ
Thematically restricted [+r]	OBLθ	OBJθ

The ‘+’ and ‘-’ values represent the marked and unmarked values of the features. The feature [-o] refers to a non-objective syntactic function, the kind of function which complements intransitive predicators such as N and A. Only subject and obliques are [-o], and objects and restricted objects are [+o] (Bresnan, 2001, p.308). This decomposition of grammatical functions into distinctive values enables us to establish a markedness hierarchy: while SUBJ is [-r, -o] is the least marked grammatical function and OBJθ (restricted object) [+r, +o] is the most marked, OBJ and OBLθ stand between SUBJ and OBJθ as they both carry a [+] and a [-] value. According to this table, Bresnan (2001, p. 308-9) develops hierarchy of the core arguments as follows:

(5.38) SUBJ > OBJ, OBLθ > OBJθ

Each thematic role in the a-structure is mapped to an intrinsic feature classification (Dalrymple, 2001; Falk, 2001). These mapping principles which are based on the underlying lexical semantics of the roles are proposed by Bresnan (2001, p.309) as follows:

**(5.39) Mapping principles of  $\theta$ -structure to a-structure**

- a) patient-like roles (patients and themes) mapped to  $\theta$  [-r]
- b) secondary patient-like roles mapped to  $\theta$  [+o]
- c) other roles (non-theme/patient arguments) mapped to  $\theta$  [-o]

As for the mapping of a-structure to grammatical functions (f-structure), Bresnan (2001, p.311) puts forward the following syntactic principles, where  $\theta^{\wedge}$  stands for the most prominent semantic role in the thematic hierarchy:

**(5.40) Mapping principles of a-structure to f-structure**

- a) (i)  $\theta^{\wedge}$  [-o] is mapped onto SUBJ when initial in the a-structure  
(ii)  $\theta$  [-o] is mapped onto SUBJ
- b) Other roles are mapped onto the lowest compatible function in the partial ordering of functions

The Agent argument, represented in a-structure with an intrinsic value of [-o] as the highest argument of the predicate on the hierarchy, can only map to SUBJ. The Patient/Theme argument, represented as [-r], may map to SUBJ or OBJ. And the Location argument, with an intrinsic value of [-o], expresses non-objective grammatical functions and thus mapped to either OBL or SUBJ (Falk, 2001, p.104).

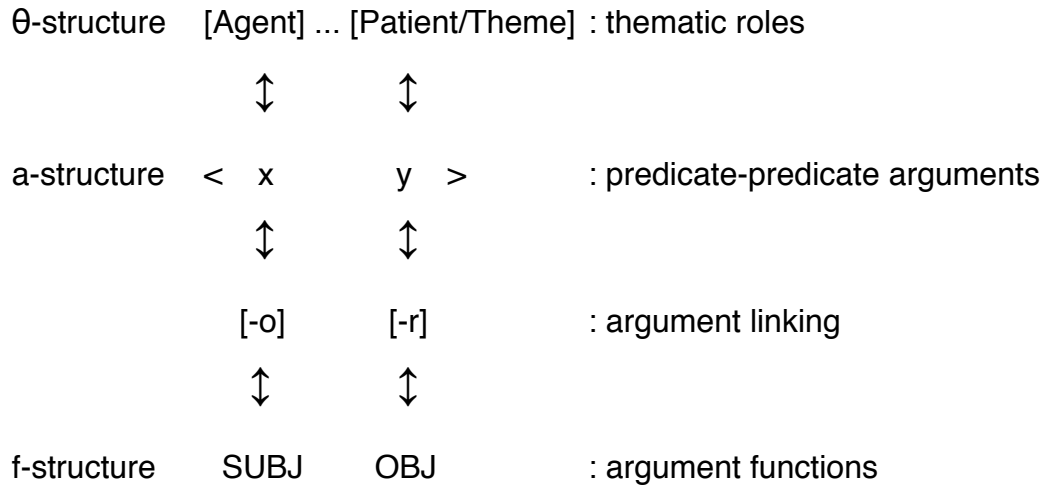
Bresnan (2001, p.311) notes that these mapping principles are also constrained by the following two conditions:

**(5.41) a. Function-argument biuniqueness:** Each a-structure role must be associated with a unique f-structure function, and each f-structure function corresponds to a unique a-structure role.

**b. The Subject Condition:** Every predicator must have a SUBJ.

Following Fabri's (2008, p.55) analysis of basic mapping principles discussed above, we can develop the mapping relationship as follows:

(5.42) *it* 'push' < (↑SUBJ) (↑OBJ) >



As for passivisation, in LFG it is considered as a lexical alternation of relation changes in predicate-function mappings (Bresnan, 2001; Falk, 2001). This means that active and passive verb forms are both listed in the lexicon, and share the same predicate argument structure, but “the roles are lexically associated with, or mapped to, alternative sets of grammatical functions, S (subject) or O (object)” (Bresnan, 2001, p.26). Falk (2001, p.90) notes that passivisation results from a remapping operation and proposes the following rule that shows the universal characterisation of the passive where the “ $\mapsto$ ” symbol denotes ‘maps into’:

(5.43) (↑SUBJ)  $\mapsto$   $\emptyset$   
 (↑OBJ)  $\mapsto$  (↑SUBJ)

This remapping operation creates “suppression” since the most prominent role can no longer be mapped to a syntactic argument in f-structure (Bresnan, 2001, p.310). The rule of passive denoting the remapping of grammatical functions expresses the cross-linguistic characteristic of passivisation. Passivisation in Turkish also follows this universal rule with the verb morphologically marked with the passive affix. Thus, the predicate *it* ‘push’ discussed above can be illustrated in terms of the lexical analysis which would give us the active and passive forms as follows:

(5.44a) active:

*Adam      ineg-i      it-iyor.*

Man            cow-ACC    push-PRE-(3SG)

“The man is pushing the cow.”

**Lexical entry:**    it-    V    ‘push <(↑SUBJ) (↑OBJ)>’

(5.44b) passive:

*Inek* (adam tarafindan) *it-il-iyor.*

Cow (man by)            push-PASS-PRE-(3SG)

“The cow is being pushed (by the man).”

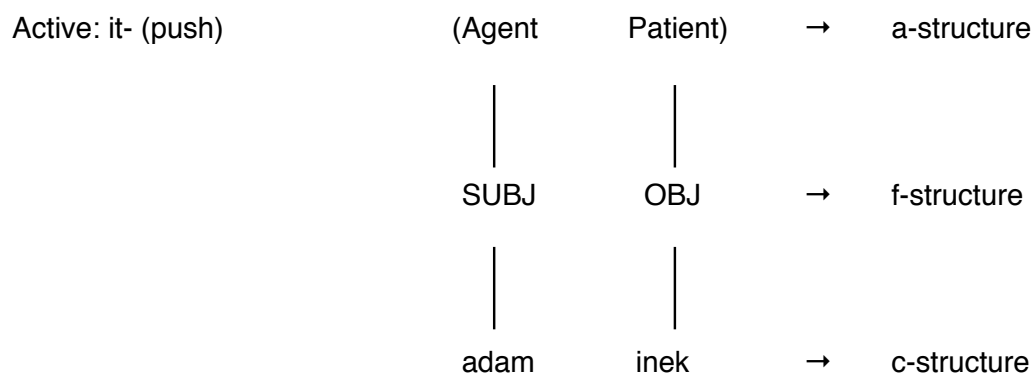
**Lexical entry:**    it-il    V    ‘pushed < ∅ (↑SUBJ) >’

In (5.44a) and (5.44b) the mapping of the arguments is different. In (5.44a), the first argument (the Agent) is mapped to the grammatical function SUBJ and the second (the Patient) is mapped to OBJ, whose distinctive features are illustrated as follows:

(5.45) **Active**

<i>it</i> ‘push’	< agent	patient/theme >
Intrinsic	[-o]	[-r]
Default	[-r]	
Mapping principle		[+o]
<hr/>		
	SUBJ	OBJ

According to this classification, the predicate *it* ‘push’ has Agent and Patient as its thematic roles. Agent is mapped to SUBJ since it is the most prominent argument role and thus the highest in the thematic hierarchy with the intrinsic values [-o] and [-r]. However, Patient is mapped to OBJ since it has the intrinsic value [+o] besides [-r] which prevents it from being mapped to SUBJ, and thus fulfils the principle of Functional-Argument Biuniqueness. Pienemann et al. (2005, p.218) propose that this type of mapping relationship is canonical, which is illustrated as follows:

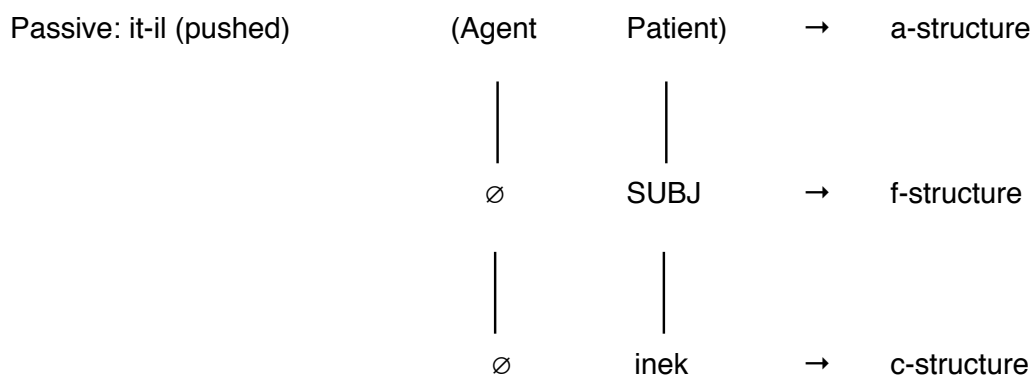


In (5.44b), however, the second argument is mapped to SUBJ while the first argument, the highest thematic role is suppressed and unexpressed in the syntax. The NP may optionally appear as an argument ADJUNCT (Bresnan, 2001, p.310). The distinctive features of the arguments in (5.44b) are given as follows:

**(5.46) Passive**

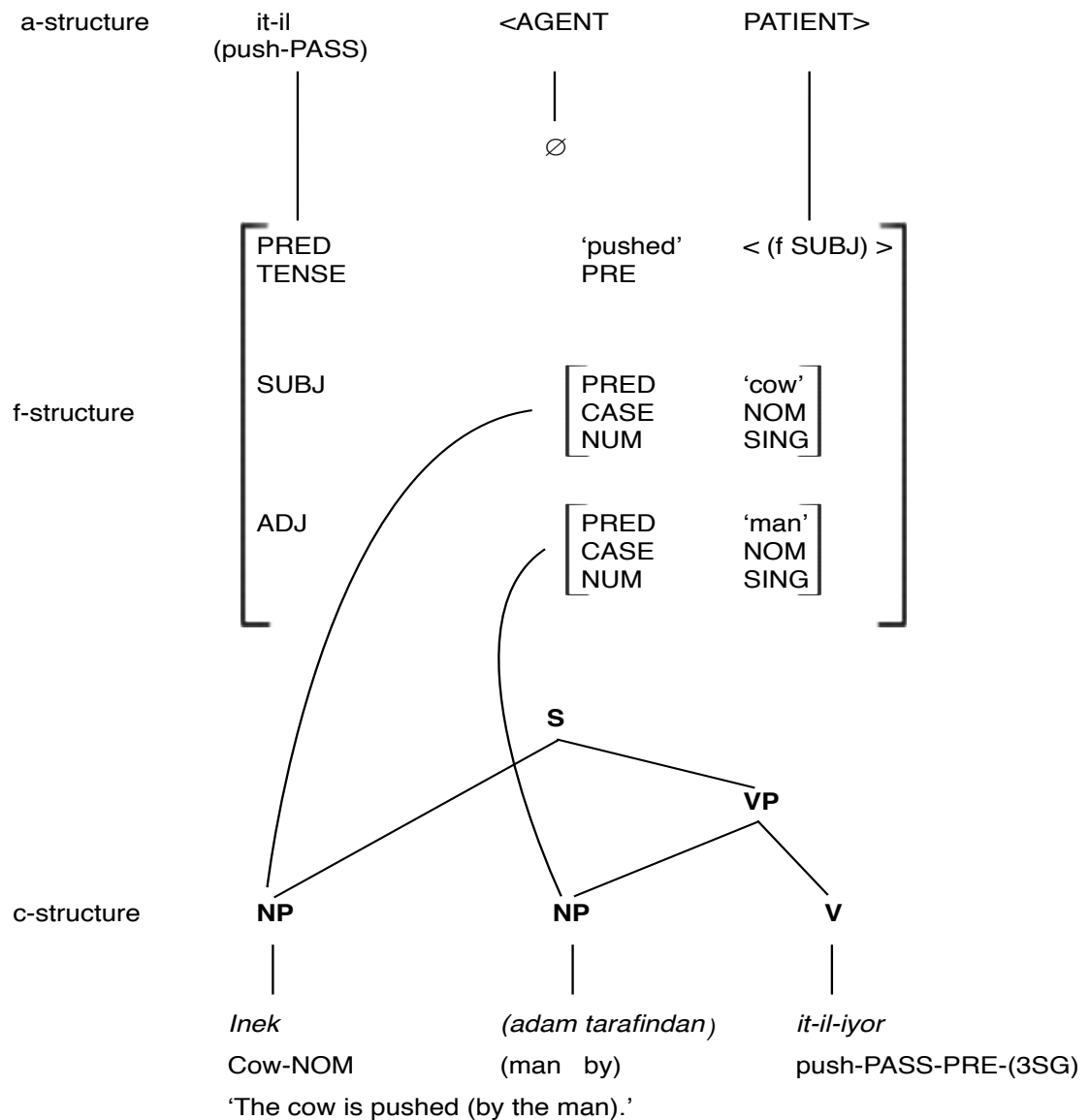
it-il (pushed)	< agent	patient >	
Intrinsic	[-o]	[-r]	
Morpholexical operation	∅		
Mapping principle		[-o]	
			SUBJ

Patient intrinsically has the value of [-r]. In passivisation, since Agent is suppressed, it receives the value of [-o] to satisfy the constraining Subject Condition, and thus is mapped to SUBJ. According to Pienemann et al. (2005, p.218), this remapping operation is non-canonical since the most prominent argument role (Agent) can not mapped to its default function SUBJ. This is illustrated as follows:



The mapping from a-structure to f-structure functions as illustrated above follows the theoretical principles of Lexical Mapping Theory (Bresnan, 2001). The relationship between a-structure, c-structure and f-structure of the sentence (5.44b) will look as follows:

(5.47) a-structure, c-structure and f-structure for *inek adam tarafindan itiliyor*



From a processability perspective, passive is analysed according to its mapping operations as described in the Lexical Mapping Theory (Bresnan, 2001). Since the canonical association between the thematic roles and grammatical functions no longer exists due to the suppression of the predicate's initial argument, the Agent function is associated with a non-initial argument via a non-canonical mapping (Pienemann et al., 2005, p.218-219). In her analysis of passive and causative in Japanese, Kawaguchi (2005, p.270) proposes that a non-canonical

mapping can only be formed in S-node since it stores the information licensing the functional destination of the NPs. As in the construction of passive in Turkish, this operation requires the unification of grammatical information across the boundaries of constituents VP and NPs. This is an inter-phrasal procedure, which is triggered by specific morphological operation for a non-linear lexical mapping (Kawaguchi, 2005). Thus, passive in Turkish is predicted to be acquired at Stage 4.

Earlier in this chapter, I illustrated the relationship between the case marking and core arguments of a predicate with the following principles:

$$(5.48) \quad (\downarrow \text{CASE}) = \text{NOM} \quad \rightarrow \quad (\uparrow \text{SUBJ}) = \downarrow$$

$$\quad \quad (\downarrow \text{CASE}) = \text{ACC} \quad \rightarrow \quad (\uparrow \text{OBJ}) = \downarrow$$

In Turkish case marking for subject nominal is a zero allomorph ( $\emptyset$ ). In Passive construction the Patient, which otherwise has direct object case marking (ACC) in an active sentence as in (5.44a), is mapped to the grammatical function Subject which requires a change in its case system as in (5.44b). According to Kawaguchi (2005), another operation that is carried out in Japanese Passive is the case marking for the NP argument where the nominal case marker *-ga* signals an inside-out unification (Nordlinger, 1998, p.62). That is,

“the case morpheme itself creates the f-structure of the NP to which it belongs and thus contributes to the higher f-structure. The information coming from the f-structure of NP arguments and the information specified by the predicate must be compatible with each other in order to satisfy the well-formedness condition. This requires unification at the S-level.”

(Kawaguchi, 2005, p.275)

Pienemann et al. (2005) make distinction between stative passives (‘the fence is painted’, ‘the city is destroyed’ etc.) and other passives (‘Tom was confused by Mary’ etc) in terms of the absence of a ‘suppressed thematic role’ (Bresnan, 2001, p.310). It has been shown that the non-linear a- to f-structure mapping is created by the the suppression of the agent role. However, the stative passives allow for canonical mapping at c-structure level, which conforms to the Unmarked Alignment Hypothesis in that there is no thematic role that is suppressed. Pienemann et al. (2005) predict that due to the

canonical mapping processes involved in stative passive, learners may be able to produce such structures at an early stage.

Following this distinction between stative passive and other passives, I argue that Turkish sentences that undergo a passive morpholexical operation can be divided into two main categories according to the mapping procedures involved; namely passives that require the thematic argument to be suppressed and passives that do not require the thematic argument to be suppressed.

Descriptive grammars of Turkish distinguish three different types of passives: personal, impersonal and middle as well as reflexivity which is formed by the same verbal suffix (Ekmekci, 1979; Göksel & Kerlake, 2005; Özsoy, 1990, 2009; Taneri, 1996). Personal passives are those which result in the suppression of the thematic argument that has the agent or the experiencer role.

#### (5.49) **Personal Passive**

*Ben toplantı-ya komite tarafından davet + ed-il-di-m.*  
I meeting-DAT committee by invite-PASS-PAST-1SG  
'I was invited to the meeting by the committee.'

As described above, this type of passive requires constructing a non-linear mapping since the initial argument of the predicate "invite" is suppressed and the Patient "I" has nominal case marking ( $\emptyset$ ), which signals an inside-out unification.

On the contrary, impersonal passive constructions cannot have agents in Turkish (Kornfilt, 1997, p.224). Impersonal passives can be constructed with verbs that have indirect objects, objects in oblique cases like the dative or ablative or locational objects. Kornfilt (1997, p.358) also points out that agentive phrases, which would be realised as an Adjunct, can not be used and no constituent appears in the canonical subject position in impersonal passives.

#### (5.50) **Impersonal Passive**

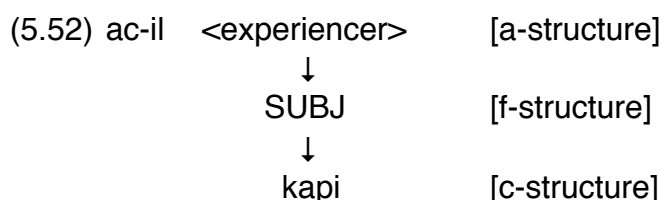
*Ankara-ya otobüs-le gid-il-ir.*  
Ankara-DAT bus-INST go-PASS-AOR.  
'One goes to Ankara by bus.'

Since there is no Agent involved in the construction of impersonal passive, there is no requirement for suppressing it or remapping the Patient role to Subject function either. Thus, the relationship between a-structure and f-structure is still canonical, and it is predicted that this type of passive is acquired at Stage 2.

Similarly, in middle passives the agent is arbitrary and irrelevant (Göksel, 1993, p.399). This type of passive is used to describe states or changes of states that the objects (Patients) undergo and in such structures the property described by the verb does not necessarily result from the action performed by an agent but rather, as Savaşır and Gee (1982, p.610) propose, it "arises out of the properties of the object" itself.

(5.51) **Middle Passive**

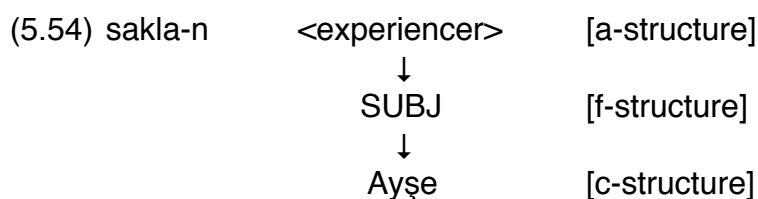
*Kapi ac-il-di.*  
 Door open-PASS-PAST.  
 'The door opened.'



Another type of construction that uses the same form of suffixation is the reflexive in Turkish. They are formed by the attachment of suffix -(i)n (and in some cases -il) to a number of transitive verbs in which the agent can perform an act on himself/herself.

(5.53) **Reflexive**

*Ayşe sakla-n-di.*  
 Ayşe hide-REF-PAST  
 'Ayşe hid herself.'



As seen in (5.53) and (5.54), the thematic argument experiencer (Agent) is mapped to grammatical function Subject, which is a canonical mapping procedure. Since these two types of passive do not require suppressing the most prominent role or a remapping operation, it is predicted to be acquired at Stage 2 too. In other words, they obey the Unmarked Alignment Hypothesis in that no thematic role is suppressed and they are canonically mapped from a- to f- structure.

### **5.1.7 Relative Clauses**

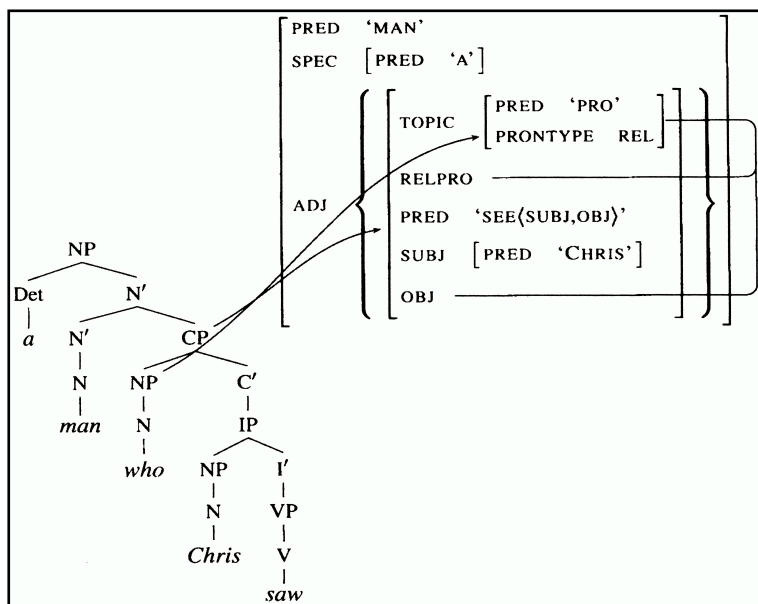
Relative clauses are an especially interesting type of filler-gap constructions, which exhibit long distance dependencies where “constructions in which a displaced constituent bears syntactic function usually associated with some other position in the sentence” (Dalrymple, 2001, p.389). Keenan (1985, quoted after Kroeger, 2004) suggests three basic strategies which mark the relativised function in many languages, which is defined according to the function of the head noun in relation to the modifying clause. These strategies are as follows: (a) *the gap strategy* involves a filler-gap relation where the nominalised element is omitted from the modifying clause and the head noun is interpreted as filling this gap; (b) *the resumptive pronoun (or pronoun retention) strategy* involves a pronominal copy of the head noun which is assigned with the relativised function where resumptive pronouns are regular personal pronouns that agree with the head noun gender and number; and (c) *the relative pronoun strategy* involves a relative pronoun, an anaphoric element which introduces the modifying clause and takes the head noun as its antecedent. While some languages use relative pronouns or resumptive pronouns to mark the long-distance dependency (e.g., English, Persian), other languages (e.g., Turkish, Kikuyu) signal long-distance dependency constructions by means of special morphological or phonological forms (Dalrymple, 2001, p.408). In either construction, the head noun bears two grammatical relations at the same time: (a) it functions as the filler, and (b) it is assigned a grammatical relation and semantic role within its modifying clause, which is also determined by the rules for NPs in general, and the syntax of the larger clause in which it occurs (Kroeger, 2004).

According to Kaplan and Zaenen (1989), long-distance dependencies can be handled by allowing regular expressions in simple attributes within f-structure constraints so that phenomena requiring infinite disjunctive enumeration can be described with one formal specification. In LFG formalism, such functional relationships are called functional uncertainty under which long distance dependencies are licensed locally, one f-structure at a time (Dalrymple, 2001; Falk, 2001).

The following analysis is largely taken from Charters (2012), Dalrymple (2001, pp. 400-405) and Falk (2001, pp.162-165).

Dalrymple (2001, p.401) illustrates the c-structure and f-structure for the phrase “a man who Chris saw” as follows:

(5.55) c-structure and f-structure for “a man who Chris saw”

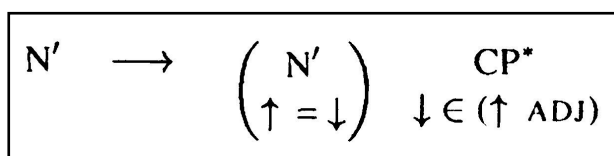


(Dalrymple, 2001, p.401)

In (5.55) the relative pronoun is in initial position in the relative clause. Its f-structure is both the TOPIC and the RELPRO of the relative clause.

Dalrymple (2001) proposes the following phrase structure rules for the analysis of such examples:

(5.56)



(Dalrymple, 2001, p.402)

(5.57)

$$\text{CP} \rightarrow \left( \begin{array}{c} \text{RelP} \\ (\uparrow \text{TOPIC}) = \downarrow \\ (\uparrow \text{TOPIC}) = (\uparrow \text{RTOPICPATH}) \\ (\uparrow \text{RELPRO}) = (\uparrow \text{TOPIC RELPATH}) \\ (\uparrow \text{RELPRO PRONTYPE}) =_c \text{REL} \end{array} \right) \left( \begin{array}{c} \text{C}' \\ (\uparrow = \downarrow) \end{array} \right)$$

(Dalrymple, 2001, p.403)

Dalrymple (2001, p.403) proposes that the constraint  $(\uparrow \text{TOPIC}) = \downarrow$  in (5.57) requires the f-structure corresponding to the RelP node to fill the TOPIC role in the f-structure. According to the constraint  $(\uparrow \text{TOPIC}) = (\uparrow \text{RTOPICPATH})$  in the next line, the TOPIC f-structure also fills a grammatical function within the clause, which is licensed by the long-distance path RTOPICPATH. The annotations in the third and fourth lines ensure that the value of the RELPRO attribute in the relative clause f-structure appears as the relative pronoun. The annotation in the third line,  $(\uparrow \text{RELPRO}) = (\uparrow \text{TOPIC RELPATH})$ , also requires the value of the RELPRO attribute to appear at the end of the path RELPATH within the TOPIC f-structure. In the final line, the constraining equation  $(\uparrow \text{RELPRO PRONTYPE}) =_c \text{REL}$  requires the value of the RELPRO attribute to have a PRONTYPE feature with value REL, which is that the value of the RELPRO attribute must be a relative pronoun. Therefore, Dalrymple (2001, p. 403) develops the English RTOPICPATH as follows, which constrains the long-distance path in topicalisation constructions:

(5.58) English RTOPICPATH

$$\left\{ \text{XCOMP} \mid \begin{array}{c} \text{COMP} \\ (\rightarrow \text{LDD}) \neq - \end{array} \mid \begin{array}{c} \text{OBJ} \\ (\rightarrow \text{TENSE}) \end{array} \right\}^* \left\{ \left( \begin{array}{c} \text{ADJ} \\ \neg(\rightarrow \text{TENSE}) \end{array} \right) \mid \begin{array}{c} \text{GF} \\ \text{GF} \end{array} \right\}$$

Given these facts, Dalrymple (2001, p.405) proposes the following definition of RELPATH in English:

(5.59) English RELPATH

$$\{ \text{SPEC}^* \mid [(\text{OBL}_\emptyset \text{ OBJ})^*] \}$$

Turkish relative clauses are also gapped sentences and show long-distance dependencies (Çetinoglu, 2009; Çetinoglu & Oflazer, 2006). They are formed by means of a participle construction; they are prenominal, verb-final and externally headed; that is, the relativised NP is external to the relative clause

and is marked for its grammatical function in the matrix clause (Blix, 2011). They can be analysed under subordinate clause procedure because of their non-canonical word order rule (Subject-Verb inversion) and unique morphological marking on the verb. Unlike languages with relative pronouns or resumptive pronouns, due to its agglutinative nature, relativisation in Turkish is achieved by means of a morphological affixation to the verb which then becomes non-finite. There are two types of morphological operations that can be done. When the function of the relativised NP is that of the Subject (e.g., the subject as in (5.60) below), relativisation is achieved by the affix *-(y)an*. For all other relativised functions, non-subject relativisation, (e.g., the direct object as in (5.61) below) it is achieved by the affix *-dik*. In the subject relative (SR), the external argument (i.e. the thematic subject) is relativized and it remains without case. In the non-subject relative (NSR), the subject (when overt) is marked with the genitive case, and agrees with the relativised noun in the nominal possessive paradigm. The following examples illustrate the two types of RC formation:

(5.60) *[e]* at-i çek-en adam gül-üyor.  
*[e]* horse-ACC pull-S.REL guy smile-PRE-3SG  
 ‘The man who pulls the horse is smiling.’

(5.61) adam-in *[e]* çek-tig-i at kisni-yor.  
 man-GEN *[e]* pull-O.REL-POSS horse neigh-PRE-3SG  
 ‘The horse which the man pulls is neighing.’

For Turkish relative clauses, the long-distance dependency construction is signalled by means of morphological suffixes *-(y)an* or *-dik* in relation to the gap in the sentence. The suffix introduces an inside-out functional uncertainty path, which means that the suffix functionally forces the head N to control the gap found in the relative clause. As addressed in role of morphology above in passivisation, Nordlinger (1998) developed the model of constructive case within LFG for the use of inside-out constraints whereby morphological constituents/processes may actively define properties of their clausal environment independently of syntax. In constructive morphology, an inflectional morpheme imposes an existential constraint that the f-structure of which it is a

part must bear a certain function in the larger f-structure. Metaphorically, the morpheme “constructs” its own context, whence the name (Falk, 2001, p.79).

In the light of these facts discussed above, Turkish relative clause c-structure rules for the sentence (5.60) and (5.61) can be formalised as follows:

(5.62) S → (NP\*) V  
 (↑SUBJ, OBJ, OBL)=↓ ↑=↓

(5.63) NP → N , (CP<sub>RC</sub>)  
 ↑=↓ ↓∈(↑ADJ)

(5.64) CP → (NP\*) V<sub>RC</sub>  
 (↑SUBJ, OBJ, OBL)=↓ ↑=↓

(5.65) V<sub>RC</sub> → V<sub>-FIN</sub> + C  
 -en C ¬(↑TENSE)  
 (↑TYPE) = S.REL  
 (GF\*↑) = (↑SUBJ)  
 (↑SUBJ LDD) = +  
 -dik C ¬(↑TENSE)  
 (↑TYPE) = O.REL  
 (GF\*↑) = (↑OBJ)  
 (↑OBJ LDD) = +

The first annotation (5.62) is similar to the annotation on the sentence rule in (5.9) of this section. The constraint ↓∈(↑ADJ) in (5.63) requires the f-structure corresponding to the CP node to fill the NP role in the f-structure. The constraint V<sub>RC</sub> in (5.65) shows that it has a grammatical function within the clause, which is annotated by the constraint (GF\*↑) in (5.65), which is constrained by long-distance dependency.

Given these facts, I propose the definition of RELPATH in Turkish will look as follows:

(5.66) Turkish RELPATH

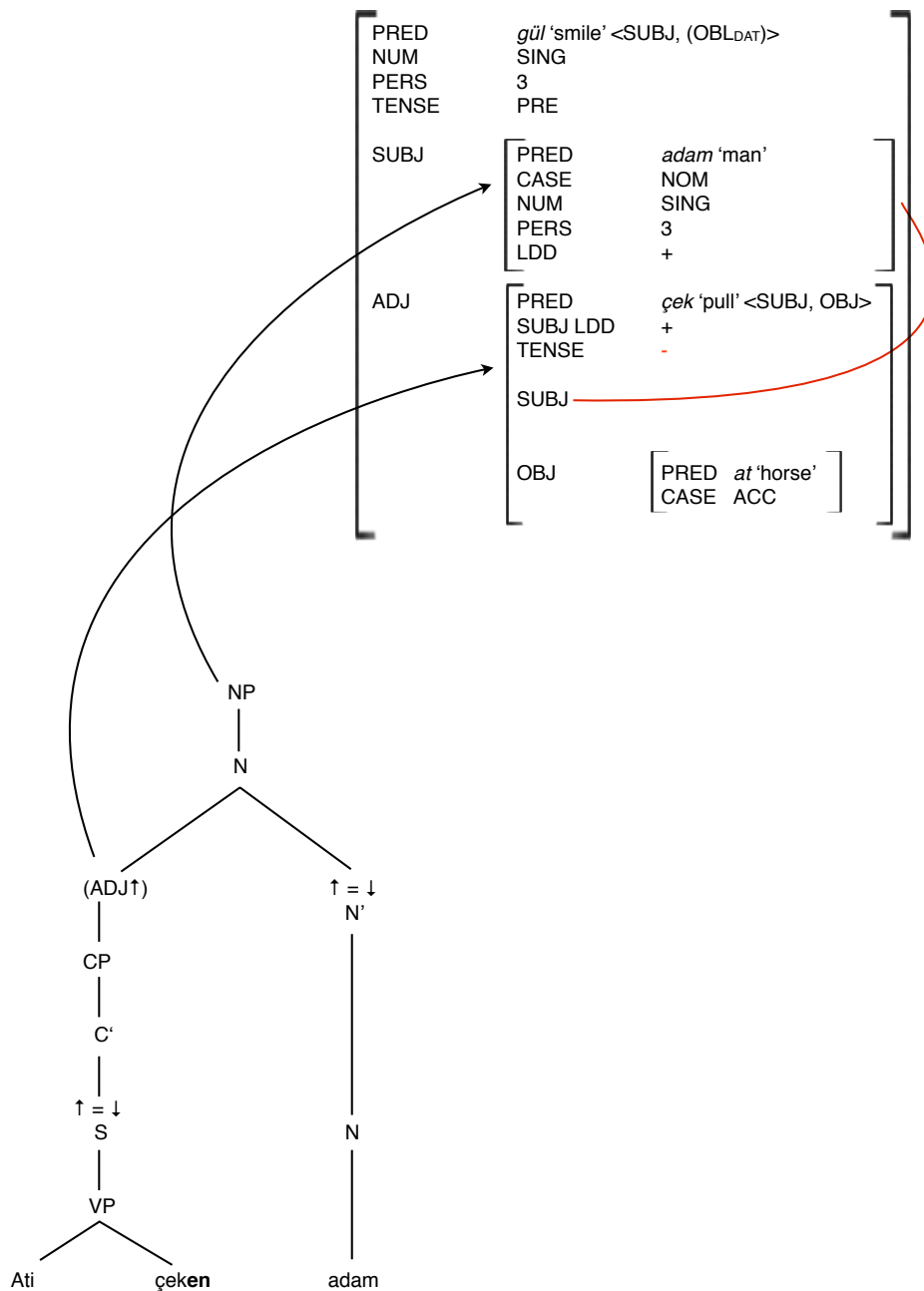
{COMP\*↑}    {(ADJ ∈) GF}

(→ LDD = +)    ¬(→TENSE)

This path shows that the relative clause appears in fronted position, it is not tensed and fulfils a grammatical function which is licensed by long-distance dependency rules.

Therefore c-structure and f-structure of the relative clause in (5.60), which is repeated here, will look as in (5.67).

(5.67) c-structure and f-structure for *Ati çeken adam gülüyor*.



Unlike the relativisation in languages like English, in Turkish relative clause there is no semantic relationship between the head noun and the relativisation suffix since there is no relative pronoun or a topicalised nominal that controls the gap (Dalrymple, 2001). The relativised verb phrase in Turkish functionally unifies with the appropriate argument of the verb (i.e., Agent = Subject, and Non-agent = Non-subject), which is licensed by inside-out functional uncertainty to solve the long-distance dependencies. In contrast to main clause canonical word order (SOV), the relativisation process requires the non-finite verb to be placed before the modified noun which can be seen in the following examples:

(5.68a):     *Adam uyu-du.*  
 Man   sleep-PAST-3.SG  
 ‘The man slept.’

(5.68b):     *uyu-(y)an   adam...*  
 sleep-S.REL man  
 ‘The man who sleeps/slept...’

In PT, the subordinate clauses differ from main clauses with their unique structural features. For instance, English relative clauses are not treated as subordinate clause because both main clause and relative clause exhibit the same structural features. Comparable to ‘Cancel inversion’ in English (e.g., ‘I don’t know where he has gone.’), Turkish relative clauses can be analysed within the subordinate clause procedure since, as analysed above, they have specific internal structure (word order and morphological marking), which is different from main clause structure. According to PT predictions, the syntactic dependency between the displaced head noun of the relative clause and its syntactic function is available when the S-procedure is acquired where, for instance, argument roles can be non-canonically mapped to the grammatical functions that are not the most-prominent (e.g., passive) or discourse functions can be mapped non-canonically to the grammatical functions (e.g., Object topicalisation). Moreover, Kawaguchi (2005, p.290) argues that the structures that involve functional uncertainty require S-procedure and thus are expected to be acquired later. The grammatical function that the NP the relative clause belongs to needs to be determined and attached to the S-node for the sentential information to be stored in the S-holder (Pienemann, 1998b). This

requires exchange of grammatical information between the subordinate clause and main clause (inter-clausal procedure). For this reason, Turkish relative clause acquisition is predicted to be located at Stage 5.

## 5.2 Word order, Topic and Focus in Turkish

A discussion on the word order and the realisation of information structure in Turkish is necessary since it will be demonstrated below that from an LFG perspective derivations from canonical mapping of TOPIC and FOCUS onto constituents require further mapping mechanisms (Bresnan, 2001), and thus reflect a hierarchical path of language development (Pienemann et al, 2005). As stated earlier in this section, SOV is the default word order in Turkish, the least pragmatically marked word order (Çagri, 2005; Greenberg, 2000; Kural, 1992) and there are restrictions on its seemingly free word order. These restrictions result from the different pragmatic conditions in the word order since not all words orders are as equally unmarked as SOV (Batman-Ratyosyan & Stromswold, 1999; Erguvanli, 1984; İşsever, 2000). The permutations in the order of constituents are a result of grammatical processes such as topicalisation, focusing and back-grounding (Erguvanli, 1984; Erku, 1983; Göksel & Özsoy, 1998).

While a declarative clause with three constituents can have six possible orderings, generally subject-initial sentences are the most natural and verb-initial sentences are the least natural. The six Turkish case-markers (NOM, ACC, DAT, LOC, ABL, GEN) can indicate grammatical relations and thematic roles independently of word order (Kornfilt, 1997), which enables Subject and Object to scramble with equal ease (Erguvanli, 1984; Kornfilt, 1997). This scrambling is illustrated in the following examples:

(5.69) Emel            elma-(y)i      ye-me-di.      SOV  
           Emel            apple-ACC    eat-NEG-PAST-3SG.  
           ‘Emel did not eat the apple.’

(5.70a) Elmayi        Emel            yemedi.        OSV

(5.70b) Emel        yemedi        elmayi.        SVO

(5.70c) Elmayi yemedi Emel. OVS

(5.70d) Yemedi Emel elmayi. VSO

(5.70e) Yemedi elmayi Emel. VOS

In Turkish, the nominative case is null and objects that are overtly marked have a definite reading while non-casemarked objects have indefinite or plural reading (Batman-Ratyosyan & Stromswold, 2002; Von Heusinger & Kornfilt, 2005). These can be seen in the following examples:

(5.70) Çocuk elma ye-di.

Child- $\emptyset$  apple- $\emptyset$  eat-PAST-3SG

‘The child ate an/any apple.’

(5.71) Çocuk elma-yi ye-di.

Child- $\emptyset$  apple-ACC eat-PAST-3SG

‘The child ate the apple.’

Kornfilt (1997) also proposes that word order is related to discourse and pragmatic information where topicalised constituents are at the sentence-initial position, backgrounded constituents at the post-verbal position, and new information or focused constituents occur immediately before the verb. The constituents in (5.72) are in the canonical order, the least pragmatically marked word order, while in (5.73), they are in different positions and thus the pragmatic information is realised differently where *kitab* is Topic, *Ayşe* is Focus, and *Mehmet* is backgrounded.

(5.72) Mehmet Ayşe-ye kitab-i ver-di.

Mehmet Ayşe-DAT book-ACC give-PAST-3SG.

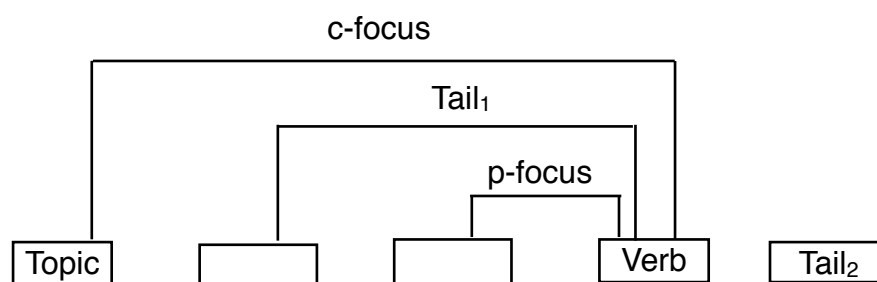
‘Mehmet gave the book to Ayşe.’

(5.73) Kitab-i Ayşe-ye ver-di Mehmet.

Book-ACC Ayşe-DAT give-PAST-3SG Mehmet.

‘Mehmet gave the book to Ayşe.’ (or ‘The book, Mehmet gave it to Ayşe’)

As discussed earlier, the pro-drop nature of Turkish allows null subjects. Enç (1991) proposes that the drop of Subject is a sign of no change in the topic of the conversation, and that the overt use of Subject marks the change of topic in the conversation. Similarly, according to İşsever (2003), syntax and phonology, by means of word order and prosody, are both responsible for the realisation of topic and focus in Turkish. Following Vallduví and Engdahl (1996), Hoffman (1995), and Kılıçaslan (1994), İşsever (2003, p.1028) concludes that information structure is tripartite in Turkish which is represented in the surface level of Turkish sentences as shown in the following figure:



**Figure 5.1:** Information structure in Turkish (İşsever, 2003, p.1028)

In Figure 5.1, the s-initial position is an obligatory position for topic (Erguvanlı, 1984; Erku, 1983; Hoffman, 1995; İşsever, 2000, 2003; Kılıçaslan, 1994; Vallduví & Engdahl, 1996). However, that an element is sentence-initial in Turkish does not necessarily mean it is the Topic (Erguvanlı, 1984). This is in line with the criteria proposed by Li and Thompson (1967) to distinguish between topic and subject: while topics have to be definite, subjects do not. Besides, they always have sentence-initial position and they are discourse-dependent. On the verbal domain, subjects are always an argument of the verb while topic selection is not determined by the verb.

Erguvanlı (1984) refers to Noonan's (1977) sentence orientation principle to apply to topics that are not also subject and concludes that an NP other than the subject which has been fronted is a marked topic in Turkish. Thus, Erguvanlı (1984) notes that Topic formation is a pragmatic function of word order like contrastive focusing. When the subject is in sentence-initial position, it is considered to be an unmarked topic. If any definite NP which is not a subject is in the sentence initial position it is topic and marked. Similarly, İşsever (2003) proposes that Turkish topics are defined both syntactically and phonologically.

There is a prosodic requirement for topics as well as their obligatory sentence-initial position: they cannot take a primary sentential stress.

As for Focus in Turkish, there is a considerable debate among scholars regarding the strategy used (İşsever, 2003). The core discussion is whether Turkish has a defined focus position. According to some scholars, Turkish does have a focus position and focus is assigned to the element that has immediate pre-verbal slot. This is generally claimed to be the default focus position. (Demircan, 1996a,b; Erguvanlı, 1984; Erku, 1983; Hoffman, 1995; Kılıçaslan, 1994; Kornfilt, 1997). On the other hand, some researchers claim that there is no default focus position in Turkish and that it is achieved by prosody as in English (Göksel, 1998; Göksel & Özsoy, 1998, 2000; Kural, 1992). In the same line with Göksel and Özsoy (1998), İşsever (2003) makes a crucial distinction between two types of focus, namely presentational-focus and contrastive-focus, and proposes that contrastive focus can be assigned to any element in this position while presentational-focus interpretation has a restricted immediate pre-verbal position. İşsever (2003, p.1028) notes that the tail has the default post-verbal position and may occur in all positions except s-initially, while the entire pre-verbal area, including the verb itself, is the ‘focus field’ in Turkish.

Following Chomsky’s (1972) position about the relation between focus and intonation, Erguvanlı (1984) also proposes that the sentence stress occurs on the constituent just before the verb, which is in focus as the most information-bearing element in that context. In any marked order, the NP just before the verb is the one that is put into focus. The evidence for the locus before the verb as the focus also comes from syntax as well as phonology. The unmarked position for Turkish *wh-* words, which naturally signal the information is unknown thus the focus, is the preverbal position.

(5.74) *Ahmet-i kim ara-di?*

Ahmet-ACC who look-PAST

‘Who looked for Ahmet?’

(5.75a) *Hakan Ahmet-i ara-di.*

Hakan Ahmet-ACC look-PAST-3SG

‘Hakan looked for Ahmet.’

(5.75b) \**Ahmet-i Hakan ara-di.*

Ahmet-ACC [Hakan]<sub>FOC</sub> look-PAST-3SG

‘Hakan looked for Ahmet.’

According to Erguvanlı (1984), there is a difference between focus in unmarked orders and focus in marked orders. With an unmarked order, neutral focus conveys the new information in a sentence, which is the element immediately to the left of the verb as in (5.75a). It coincides with indefinite NPs. On the other hand, contrastive focus is placed on the NP immediately before the verb by a shift in the ordering of the definite NPs as in (5.75b).

In a similar vein with Erguvanlı (1984), İşsever (2003) notes that there are two syntactic and intonational focusing strategies in Turkish, which are associated with two distinct pragmatic functions, marking presentational-focus and contrastive-focus, respectively. P-focused elements are syntactically defined but are not accessible while c-focused elements are prosodically defined and accessible in the sense that they are members of a set defined by the context (İşsever, 2003, p.1034). For p-focus, (5.76a,b) is an example where the focus assigned element is replaced with the free variable in the open-proposition, which is not accessible from the context. For c-focus, (5.76c,d) provides an example:

(5.76a) *Emel ne-(y)i okul-da bırak-ti? Kitab-i mi*

Emel what-ACC school-LOC leave-PAST-(3SG)? Book-ACC Q

*çanta-yi mi?*

bag-ACC Q?

‘What did Emel leave at school? Did she leave the book or the bag?’

(5.76b) *Emel çanta-yi okul-da bırak-ti.*

Emel [çanta-ACC]<sub>FOC</sub> school-LOC leave-PAST-3SG

‘Emel left the bag at school.’

(5.76c) *Kim çanta-yi okul-da bırak-ti? Emel mi Ayşe mi?*

Who bag-ACC school-LOC leave-PAST? Emel Q Ayşe Q?

‘Who left the bag at school? Emel or Ayşe?’

(5.76d) *Emel canta-yi okul-da birak-ti.*  
 [Emel]<sub>FOC</sub> bag-ACC school-LOC leave-PAST-3SG  
 ‘Emel left the bag at school.’

Erguvanlı (1984) summarises that the immediate preverbal focus position is a pragmatic function which accommodates the most informative element in that context, while marked orders with a definite NP in the focus position assigns a contrastive prominence to that element.

From an LFG perspective, as discussed in the previous chapter, Bresnan (2001, p.97) classifies grammatical functions to account for structure-function mappings, which are repeated here for recap. The first classification distinguishes the argument functions from the non-argument functions:

(5.77)

<u>TOP, FOC,</u>	<u>a-fns</u>	<u>ADJUNCT</u>
non-a-fns	SUBJ, OBJ, OBJ <sub>θ</sub> , OBL <sub>θ</sub> , COMPL	non-a-fns

Bresnan (2001, p.97)

Argument functions bind their expressions to an argument role and they are governed by the predicate, whereas non-argument functions bind their expressions to something other than an argument role. Also, argument functions allow only single instances, whereas non-argument functions allow multiple instances (Pienemann et al, 2005, p.210).

The next classification distinguishes the grammaticalised discourse functions from non-discourse functions:

(5.78)

<u>d-fns</u>	<u>non-d-fns</u>
TOP, FOC, SUBJ,	OBJ, OBJ <sub>θ</sub> , OBL <sub>θ</sub> , COMPL, ADJUNCT

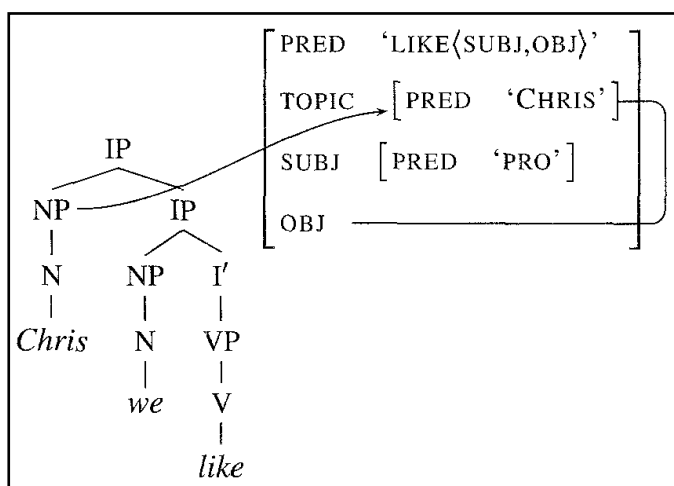
Bresnan (2001, p.98)

As also stated earlier in the previous chapter, these two classifications illustrate that SUBJECT with its unique property of being an argument function and a grammaticalised discourse function at the same time is generally identified as the default TOPIC of the clause (Bresnan (2001, p.98). Dalrymple (2001)

proposes that the TOPIC phrase must have a grammatical role in the clause according to Extended Coherence Condition, which was originally developed by Zaenen (1980). According to this condition, as Dalrymple (2001, p.390) puts forward, “FOCUS and TOPIC must be linked to the semantic predicate argument structure of the sentence in which they occur, either by functionally or by anaphorically binding an argument.”

For instance, in the English topicalisation construction, a constituent appears at the beginning of the sentence and is interpreted as the TOPIC of the sentence. In the following example. The syntax of the topicalisation construction in English can be seen:

(5.79) *Chris, we like.*



(Dalrymple, 2001, p.395)

In sentence (5.79), ‘Chris’ is the TOPIC of the sentence and also the OBJ of the verb ‘like’. The relationship between the displaced initial constituent and its within-clause grammatical function is licensed by long-distance dependency rules (Dalrymple, 2001).

Analysing topicalisation in Russian, Bresnan (2001) proposes that languages that make use of non-configurational means of function specifications do not need to employ extraction to identify a DF with a non-DF function, as in the example (5.79). Similar to Russian, in Turkish, identification of a DF with a non-DF is achieved by means of case-marking principles of function specifications as well as the variations in the constituent ordering (Erguvanli, 1984). As mentioned above, in Turkish S-initial position is the default position for TOPIC and case-markers can construct the grammatical relations and thematic roles

without relying on word order. In Turkish, except for an animate indefinite Subject, an NP is only allowed in the S-initial position with the TOPIC function if it is definite (Erguvanlı, 1984, p.158). In relation to SUBJ and TOPIC functions, thus, the following simplified principles are important:

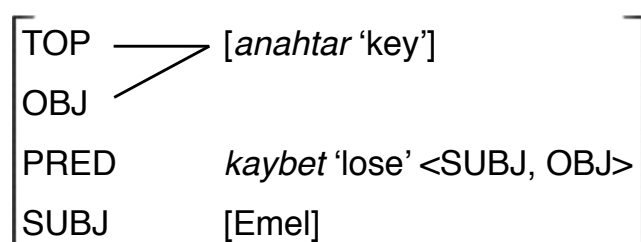
$$(5.80) \begin{array}{l} (\downarrow \text{CASE}) = \text{NOM} \quad \rightarrow \quad (\uparrow \text{SUBJ}) = \downarrow \\ (\downarrow \text{CASE}) = \text{ACC} \quad \rightarrow \quad (\uparrow \text{OBJ}) = \downarrow \end{array}$$

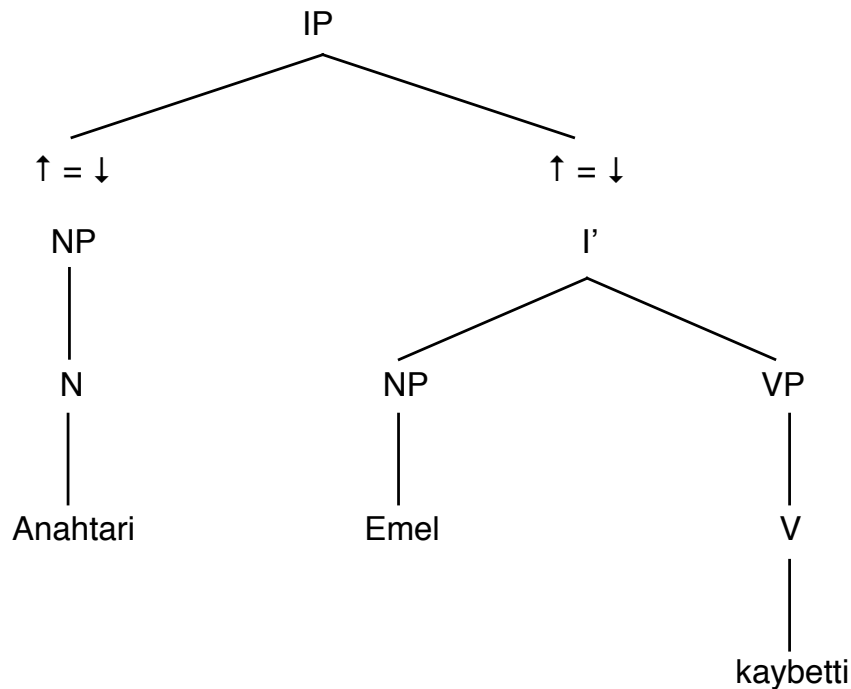
These principles can be applied to the following example to associate grammatical functions with the TOP NP.

(5.81) *Anahtar-i Emel kaybet-ti.*  
 Key-ACC Emel-NOM lose-PAST-(3SG).  
 ‘Emel lost *the key*.’

Although the object is not in its default position in (5.81), the non-configurational principle in (5.80) enables it to be successfully associated with the grammatical function of object. nominative case carries the SUBJ function and accusative case carries the OBJ function. “Because both configurational and non-configurational means of function association are simultaneously employed by the language, double functions are associated with a single constituent” (Bresnan, 2001, p.187). Thus, the f-structure of (5.81) will look as follows:

(5.82) f-structure and c-structure for *Anahtari Emel kaybetti*.





According to Falk (2001), a simplified c-structure rule for this type of sentence will look as follows:

(5.83) TOP<sub>OBJ</sub> S V

$$\begin{array}{lcl}
 \text{IP} & \rightarrow & (\text{TopicP}) \quad (\text{IP}) \\
 & & (\uparrow\text{TOP})=\downarrow \quad \uparrow=\downarrow \\
 & & (\downarrow\text{CASE}) = \text{ACC}
 \end{array}$$

This discussion on the word order in Turkish has shown that the discourse-pragmatic realisations of the constituents play a significant role in word order phenomena in Turkish. Although there are default positions for topic and focus in a canonical SOV sentence in Turkish, variation in constituent ordering is a sign of certain semantic or pragmatic distinctions. Unmarked word-order sentences are pragmatically neutral compared to marked word-order sentences which reveal their discourse-pragmatic conditions by having a particular set of restrictions. From a processability perspective, such deviations from the unmarked word order come at a cost in terms of processing. That is, production of structures that are based on discourse-pragmatic choices is constrained by their processability. This can be analysed in three developmental stages.

### 5.2.1 Subject as Topic in SOV

As discussed in Chapter 4, from a developmental perspective, PT explains the phenomenon of Topic through the Topic Hypothesis (Pienemann et al., 2005). The Topic Hypothesis predicts that initially SUBJECT is not differentiated from TOPIC. In Turkish, as explained above, TOP is also sentence initial but is not marked and not all sentence-initial constituents are TOPICs. A sentence-initial constituent that is TOPIC cannot take a primary sentential stress. It also cannot be inanimate if it is not definite. At the early stages of acquisition, learners do not recognise the grammatical functions of NP in a sentence and cannot differentiate semantic functions from TOPIC function (Kawaguchi, 2005). The default topic function is then mapped onto the agent-like function in a Turkish sentence with canonical word order:

(5.84) *Cocuk kurbaga-yi ara-di.*  
child-NOM frog-ACC search-PAST-3SG

‘The child searched for the frog.’

*ara* ‘look for’ < x, y >

Agent	patient	→ a-structure
↓	↓	
SUBJ	OBJ	→ f-structure
↓	↓	
Cocuk	kurbaga-yi	→ c-structure
(TOPIC)	(CASE <sub>ACC</sub> )	

Such canonically ordered sentences are hypothesised at Stage 2 since TOPIC canonically maps onto grammatical function SUBJ, which does not require any feature unification.

### 5.2.2 Non-core arguments as Topic

As mentioned above, the pro-drop feature of Turkish allows null subjects, which indicates that the TOP of the conversation remains the same (Erguvanli, 1984; İşsever, 2003). The introduction of an overt SUBJ indicates that TOP of the conversation changes. The unmarked word-order for a sentence with time and

place adverbs is SUBJ ADV (time,place) OBJ VERB (Erguvanli, 1984), as in the following example:

(5.85) *Ben dün ev-de kal-di-m.*

[I]<sub>TOP</sub> yesterday house-LOC stay-PAST-1SG.

'I stayed at home yesterday.'

In the absence of a SUBJ NP (i.e., when it is dropped and marked only on the verb) the time or place adverbs can occupy the sentence-initial position and become topicalised (Erguvanli, 1984, p.150).

(5.86) *Dün (ben) ev-de kal-di-m.*

[Yesterday]<sub>TOP</sub> (I) house-LOC stay-PAST-1SG

'Yesterday I stayed at home.'

Following Falk's (2001) analysis of Topic, the c-structure rule of such structures can be represented as:

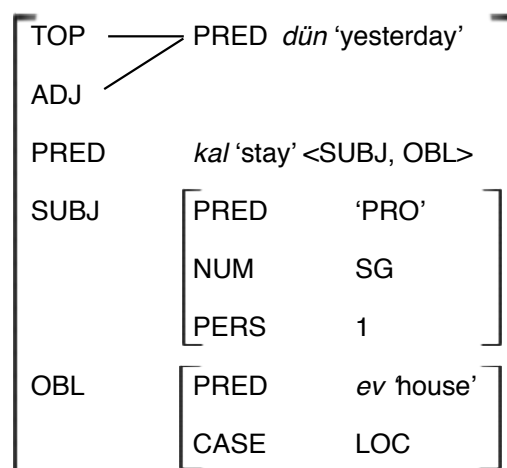
(5.87) TOP<sub>ADJUNCT</sub> (S)OV

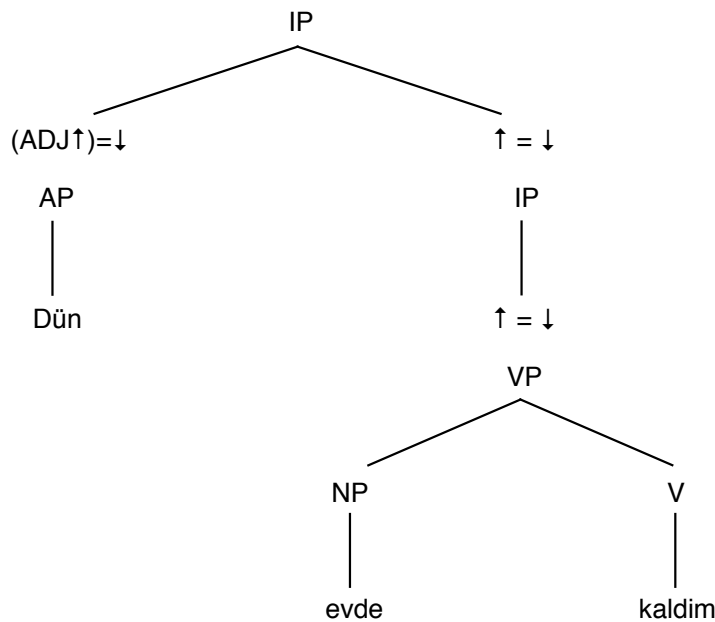
S' → (XP) S

(↑TOP)=↓ ↑=↓

The f-structure and c-structure of the above sentence show that ADJUNCT in the sentence initial position is linked to TOP in the absence of an overt SUBJECT.

(5.88) f-structure and c-structure for *Dün evde kaldım*





From a PT perspective, due to the addition of adjuncts as in (90), the SUBJ no longer occupies its canonical position in the sentence. Although the canonical word order is preserved, TOPIC is associated with a constituent in the sentence-initial position other than SUBJ. This represents the first deviation from canonical mapping of TOPIC to SUBJECT (Pienemann et al., 2005). The completeness and coherence conditions are still satisfied as the PRED “*dün (yesterday)*” double functions as Adjunct and Topic (Kawaguchi, 2005, p.280). When the sentence-initial TOPIC in the example (90) is an ADJ it is a phrasal procedure because “when TOP is ADJUNCT, it has its own PRED and does not refer to argument functions, and therefore it does not involve information exchange with other constituents of S” (Kawaguchi, 2005, p.280). Thus, ADJUNCT as TOPIC in sentence-initial position is predicted to be located at Stage 3 (Phrasal Procedure).

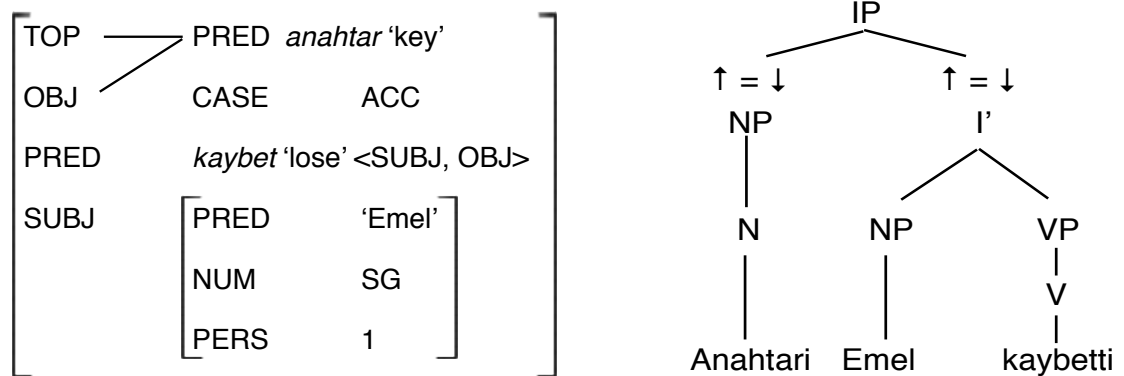
### 5.2.3 Non-subject Core Argument as TOPIC

As discussed above, sentence-initial position in Turkish (the TOPIC position) has its own restriction on the OBJ (Erguvanlı, 1984, p.27): only specific direct objects (case-marked) or overtly specific indefinite direct objects are allowed to occur in sentence-initial position, which can be seen in the following example:

- (5.89) *Anahtar-i Emel kaybet-ti.*  
 [Key-ACC]<sub>TOP</sub> Emel lose-PAST-3SG

'Emel lost the key.'

Thus, f-structure and c-structure of sentence (5.90) will look as follows:



Through the Extended Coherence Condition in LFG, “FOCUS and TOPIC must be linked to the semantic predicate argument structure of the sentence in which they occur, either by functionally or by anaphorically binding an argument” (Dalrymple, 2001, p.185). According to Bresnan (2001, p.68), a discourse function (TOPIC or FOCUS), that is not identified with an argument function is considered ungrammatical since “without the identification of TOP and OBJ provided by the functional uncertainty equation, the f-structure would be incomplete and incoherent.”

The Topic Hypothesis (Pienemann et al., 2005) predicts that mapping of TOPIC to a core argument other than SUBJECT causes structural consequences such as a deviation from the canonical order which also changes the linear mapping of discourse functions to grammatical functions. Similar to that of Japanese (Kawaguchi, 2005, p.280), the Turkish OBJ topicalisation requires functional assignment. The identification of TOPIC function with OBJ requires the learner to scramble the canonical mapping of the arguments and their semantic roles as well as the application of accusative morphology which is a prerequisite for an object to occur in sentence-initial position. According to Kawaguchi (2005, p. 280), this type of operation is processable at S-procedure since the unification of discourse functions and grammatical functions requires a higher node to fulfil both the completeness and coherence conditions. Thus, Object Topicalisation is located at Stage 4 (S-procedure).

In this chapter, linguistic rules for Turkish grammatical structures have been displayed and analysed in a processing hierarchy based on the feature

unification of grammatical information and mapping principles within the PT framework. If the analysis I have presented here is valid, then the developmental order of these grammatical structures should be as follows: category < phrasal < inter-phrasal < inter-clausal. This hierarchy will enable us to predict the implicational developmental hierarchy of these grammatical structures as observed in the data collected from Turkish heritage speakers. In the next chapter, I will present the methodological issues in this study, such as the research questions, participants, organisation of data collection and the instruments used to collect the data and the acquisition criteria used to interpret the data.

## Chapter 6. Methodology

In the previous chapters, literature about heritage language studies and the context of Turkish language in Germany were reviewed. This was followed by two theoretical chapters; one focusing on Processability Theory (PT) and the next one focusing on the application of PT formalism into Turkish grammatical structures. This chapter presents the methodological aspects of this study in five sections. Following a presentation of the main rationale and the research questions, the first section describes the participants of the study. The following four sections will discuss the the organisation of data collection, the tasks used for gathering the relevant data and the acquisition criteria utilised in the interpretation of the data.

As discussed in the review of heritage language literature, heritage language development in early childhood gets increasingly disrupted as a result of the immersion in the socially dominant language environment which starts with schooling in the wider community. Within this line of thinking, incompleteness is considered as the result of this dramatic change in the sociolinguistic environment and heritage speakers are argued to exhibit a marked degree of lower linguistic proficiency in various aspects of their heritage language grammar compared to their monolingual peers. One commonly accepted phenomenon in these studies is that the more complex a grammatical structure is, the more likely heritage speakers encounter problems in both comprehending and producing it. Since the success (or completeness) of acquisition is regarded as an ultimate product and predominantly examined in terms of the degree of heritage speakers' convergence to the monolingual linguistic proficiency, the claims of incompleteness do not sufficiently represent the complex process of heritage language development from a theoretical perspective.

Building on this lack of theoretical explicitness focusing on the process of language acquisition rather than the expected result of it, this study introduces the theoretical model of Processability Theory (Pienemann, 1998b; Pienemann et al., 2005) framework which, as discussed above in Chapter 4, can both handle the issue of grammatical complexity and account for the success of acquisition from a developmental perspective. As I have shown above in

chapters 4 and 5, the complexity of a grammatical structure can be explained according to the necessary processing procedures of feature unification and mapping principles. For example, certain verbal morphology (e.g., tense marking) in Turkish does not require any grammatical information exchange between the constituents within or across the phrases, and thus is regarded as a lexical procedure (Stage 2). However, another type of verbal morphology (e.g., passive requiring suppression of thematic argument) requires a non-linear association between the arguments of the verb and their grammatical functions. This means an exchange of grammatical information across phrases, and is thus regarded as an inter-phrasal procedure (Stage 4).

It is on this basis that the PT framework can provide a theoretical research model with predictive power to measure the development of grammatical structures in a hierarchical manner based on the necessary procedural skills. Therefore, as well as testing the typological plausibility of PT, in my investigation of Turkish heritage speakers' linguistic development within the PT framework, I aimed to answer the following three questions:

- (1) How does the developmental hierarchy of various Turkish grammatical structures fit within the PT framework?
- (2) Have young heritage speakers of Turkish in Germany reached the highest predicted stage in this hierarchy?
- (3) How can PT as a formal theory of language development contribute to the ongoing debate on incomplete first language acquisition among heritage speakers?

The answer to the first question regarding the developmental hierarchy of Turkish grammar was presented in Chapter 5, where an LFG analysis and PT formalism were applied to the following structures, nominal case morphology, tense and person morphology on the verb, pro-drop, genitive-possessive agreement, verb complements, passivisation, relativisation, word order and information structure. These structures represent a wide array of the complexity of the Turkish grammar that can be analysed and tested within the PT framework as well as providing an opportunity to test the validity of previous heritage language accounts showing complex grammatical structures (e.g.,

passive and relative clauses) are late acquired and thus vulnerable to change and non-acquisition in heritage language contexts.

Now I go on to present the methodological context, participants, data collection procedures, communicative tasks and acquisition criteria used in answering the research questions 2 and 3.

## 6.1 Participants

24 young heritage speakers of Turkish living in Munich, Germany and six young monolingual Turkish speakers living in Ordu, Turkey participated in the study. A monolingual peer group was included in the study to pilot the data elicitation tasks and to test whether they had reached the highest stage in the implicational hierarchy which the language development of heritage speakers can also be compared to. An overview of their details is given in Table 6.1 (see Appendix A for more details on heritage speaker group). The social and educational background of the participants will also be discussed in more detail below as it has been shown that the sociolinguistic background of the heritage speakers has an impact on their language development and use (He, 2010; Montrul, 2008; Treffers-Daller et al., 2011).

**Table 6.1:** Overview of the participants in this study

Groups	Munich (Heritage speakers)	Ordu (Monolinguals)
Number of participants	Male: 10 Female: 14	Male: 3 Female: 3
Educational background	Students (Hauptschule)	Students (State School)
Migration status	Third generation Turkish immigrants born in Germany (* Only 2 of them moved to Germany at 5 year-old)	Turkish monolinguals born in Turkey
Age	Mean: <b>12.8</b> Minimum: 10 Maximum: 16	Mean: <b>9.5</b> Minimum: 7 Maximum: 13
Kindergarden	Yes (age 3-4 onwards)	Yes (age 4-5 onwards)
Date of recording	2011-2012	2011-2012

The macro-variable for the selection of the participants was their age. Participants were chosen among those who were over the age of 9. For the Munich group the main variable was that each participant came from a family with migration background where either or both of the parents were Turkish who were born in Germany or migrated to Germany. This age group (the youngest around 9 years old) was specifically chosen to avoid the issues related to the Critical Age Period in first language acquisition, in view of Harley and Wang's (1997) and Montrul's (2008) assertions that up to 8-10 years of age is the period during which complete and successful first language acquisition is achieved. The Munich group is a group of Turkish-German bilingual students who were born, raised and educated in Germany<sup>7</sup>. All of them were enrolled at a Hauptschule at the time of recording, which, as mentioned above, is a type of state school and the lowest school track in Germany. These heritage speakers of Turkish have Germany-born or Turkey-born immigrant parents and have acquired Turkish as their first language in the home environment, but have subsequently switched to using German as a consequence of exposure to that language outside their home especially when they started going to all-day kindergarden at around the age of 3 onwards (Lengyel, 2012).

The monolingual control group are young Turks who were born, raised and educated in Turkey. The Turkish monolingual participants were children of my circle of friends and acquaintances. They all go to state school too where all subjects are taught in Turkish, apart from English as a foreign language which starts at the fourth grade. All of the participants belong to working class families which minimised the influence of socioeconomic background as a variation between individuals and between groups. (Lynch, 2003; Montrul, 2008, 2011; Polinsky, 2011). The parents are workers, traders or owners of small businesses. None of the parents in the Munich group hold a university degree and most of them have only attended primary school in Germany, while only three out of twelve parents of the Ordu group have graduated from a university in Turkey.

---

<sup>7</sup> Two of the participants moved to Germany when they were 5 years old (see Appendix A). Previous studies (e.g., Aksu-Koç & Slobin, 1985) reported that apart from relative clauses Turkish monolingual children acquired the Turkish morphosyntax fully before the age of 5. This issue will be addressed below in the results and discussion chapters.

## 6.2 Organisation of Data Collection

The data collection design and methods were in line with Newcastle University procedures on ethical clearance for working with children to ensure anonymity, consent, and to avoid any overload of task demands on the children. Therefore, before the data collection started, as all of the participants were underage, the consent of their parents was gained prior to data collection (see Appendix B for the consent letter). For the heritage speaker group, authorisation was also secured from the school management and the local education authority as the data collection sessions were held during school hours. In total, there were 52 students in that school who were between the ages of 9 and 14, and had Turkish immigrant background; thus, 52 consent letters were sent to their parents. Only 24 of those parents gave permission for their children to participate in the study.

The data collection sessions with the heritage speakers took place during school hours in a room in the school which was allocated for the data collection by the school management. As for the monolingual group, the sessions took place in their houses where their parents were also present. This minimised the stress on participants and also met Newcastle University ethics procedures and expectation regarding research methodology. Each participant was given brief instructions for each task and the researcher made sure they understood the procedures required for the task completion.

Each participant was invited to take part in the data collection session individually. In order to ensure consistency in the communicative tasks, the researcher himself carried out the tasks with each participant. Sessions started with a standardised semi-structured interview (see Appendix C), in which the researcher used a written list of questions as a guide to gather information about the sociolinguistic environment of the participants as well as their personal information such as age, family members and hobbies, which was thought to be a relaxing start for them feel comfortable with speaking in Turkish. As well as creating a relaxing conversation environment, the interview also ensured that the participants understood that the researcher did not know German at all and thus they were in the monolingual Turkish mode to avoid code-switching and borrowing. This was a crucial methodological adjustment to

take account Grosjean's (1998) strong urging in bilingual data collection settings to ensure that any bilingual speakers were in the monolingual mode of the language examined, since it was argued that bilingual data involving mixed-language use would affect the findings of the study.

The data collected from the informants were audio-taped with a professional voice-recorder and then orthographically transcribed using a word processing program (MS Word). Since this is a psycholinguistic research with a particular focus on morphosyntactic development, the transcription does not require detailed (e.g., conversation-analytic) conventions. Instead, within the PT framework, the focus is on presenting the features of morphosyntax as precisely as possible. Thus, the transcription conventions suggested by Pienemann (2011) were used for the transcription of the data wherever necessary (see Appendix D for transcription conventions).

### **6.3 Communicative Tasks**

Using communicative tasks enabled me to capture as complete a snapshot of language production as possible to allow for assessing the participants' linguistic skills against the hypothesised implicational scale. Besides, the tasks also made it possible to specifically target the vulnerable structures (e.g., passive, relative clauses) to measure how many of the participants were at the point of the scale where these structures could be confirmed to be robust or vulnerable.

Carrying out successful data collection sessions that yield sufficient amount of relevant data for answering the research questions in a study is challenging for language acquisition researchers (Gass & Mackey, 2007; Pienemann & Keßler, 2011). While some questions can be addressed via naturalistic data (i.e., hesitations, pauses, self-repair), targeting certain linguistic structures may necessitate using "more proactive data elicitation techniques in addition to simply examining [speakers'] spontaneous language production" (Gass & Mackey, 2007, p.20).

Within this vein, the effectiveness of communicative elicitation tasks creating linguistic contexts for the use of certain grammatical forms has been previously reported in various research contexts (Bayram, 2009; Chaudron, 2003; Gass &

Mackey, 2000, 2007; Keßler & Pienemann, 2011; Pienemann & Mackey, 1993). Keßler and Pienemann (2011) highlight that the communicative context of tasks supported by the researcher's communication strategies creates a richer linguistic context for the production of targeted structures. According to Chaudron (2003, p.772), there are four main advantages of using elicitation tasks: (a) they can be tailored to specific points of L2 learning that are the theoretical focus of the research; (b) they can be employed in a more mechanical fashion using recording instruments so that the researcher and the assistants can elicit more subjects' data with less concern for observational reliability; (c) they lend themselves for use with learners of virtually any level of L2 competence, because translations of instructions or materials can be provided; (d) they tend to be more easily analysed and scored, although transcription and coding of protocols do require reliability assessments.

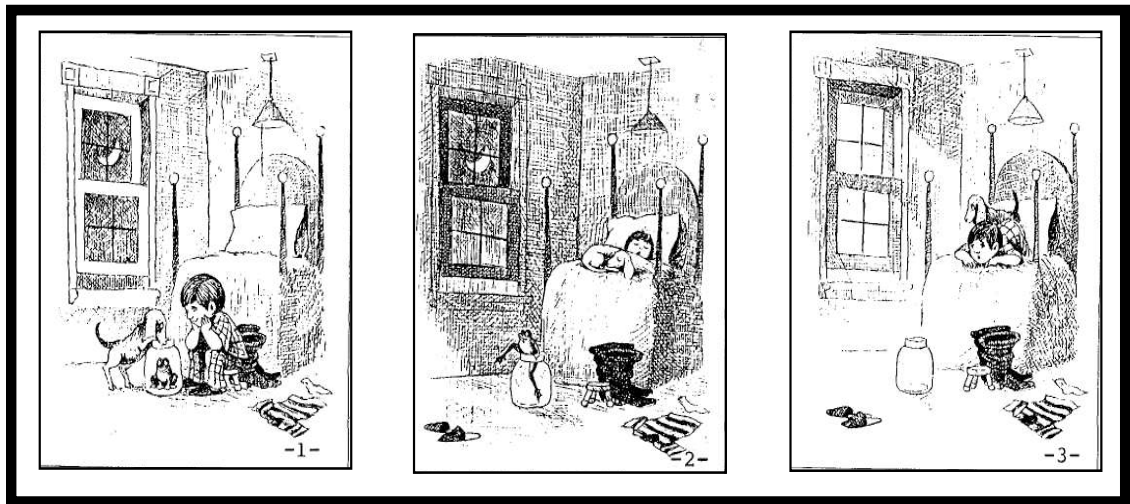
Therefore, as a follow-on to the interviews, each participant was asked to complete three communicative tasks which were used to elicit relevant and a sufficient amount of data to answer the research questions. These created communicatively appropriate contexts for linguistic rule application. Here it is important to make the distinction between existence of the linguistic context and communicative context clear. Asking a learner to talk about what a person does on a daily basis according to a set of pictures can create the functionally appropriate communicative context for the use of third person -s in order to describe someone's habitual actions in the pictures presented. The linguistic context for this communicative context, however, requires (e.g., in English) the production of third person singular subject and present tense with a verb that has third person -s and is not progressive. As stated above, creating a communicative context for the use of certain grammatical structures is important since not all structures can be observed in naturalistic data. In PT, determining whether a linguistic form has been acquired or not is based on the fact that learners have plenty of lexical contexts to use that form (Pienemann, 1998b). Thus, while creating the communicative context in data collection is essential, the predictions for learners' developmental status are made by analysing their production of rules within a sufficient number of linguistic contexts based on the emergence criterion (see section 6.4 below).

Prior to the data collection sessions with the heritage speaker group, the reliability of the communicative contexts in the tasks for linguistic rule application was tested in a small-scale pilot study with a group of participants consisting of two Turkish monolingual children, two English and two German adults. It was found that tasks indeed provided an abundant amount of communicative contexts for rule application. Therefore, the data collected from heritage speakers were regarded as a valid source for examining their language development against the hypothesised hierarchy, since online language production is constrained by access to available processing mechanisms (Pienemann, 1998b, 2005), and “whatever [participants] produce must be taken as evidence of their language processing skill and their underlying linguistic knowledge” (Håkansson et al., 2002, p.255).

The three communicative tasks are discussed below according to their order of appearance during data collection sessions.

### **6.3.1 Narrated Elicitation Task**

Many language studies have benefited from eliciting narratives from learners. One of the various ways of investigating unplanned speech is giving participants a sequence of pictures and having them to tell the story in the pictures immediately. In this research, a wordless book called *Frog, Where are you?* (Mayer, 1969) was chosen, which Hoff (2009) notes, has been used by over 150 different researchers studying children acquiring 50 different languages (e.g., Bamberg, 1987; Berman & Slobin, 1994; Kail & Hickmann, 1992; Orsolini, Rossi & Pontecorvo, 1996; Van Der Lely, 1997; Wigglesworth, 1997). Berman and Slobin (1994) also provide a summary of research on “the frog story” in five different languages.



**Figure 6.1.** The first three pictures in *Frog Where are you?* (Mayer, 1969)

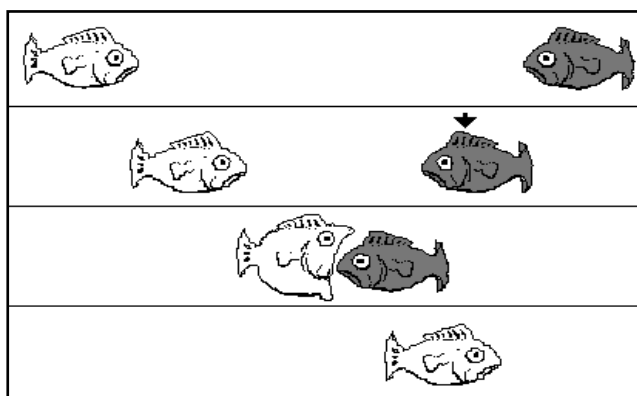
Participants were presented with the 24-page wordless picture book (see Appendix E for the full version of the picture story), and asked to tell the story to the researcher. This storybook is about a boy and his dog, and their search for their missing pet frog. While searching for the frog, the boy and dog encounter various forest animals that in some way interfere with their search for the frog. After several of these encounters, the boy and dog eventually find the frog with a mate and their baby frogs. The story concludes with the boy and dog leaving for home with one of the babies as their new pet frog. Because it contains no words, it provides a fairly rich context for language production and for the use of structure varying from very simple ones word utterances to very complex structures such as a variety of referential expressions (nominals, pronouns), a variety of verbal morphemes, compound sentences, and complex sentences containing clauses and so on. In addition to narrating the series of sequenced events, this task also creates a basis for communication between the researcher and participants as there are many opportunities for referring to characters' relationships, thoughts, feelings, and motivations throughout the story.

### **6.3.2 Passive Elicitation Task**

This task can be called a picture-description task which generally involves two participants, one of whom is asked to describe a picture to the other one. Various types of pictures can be used (Gass & Mackey, 2007). I designed this task myself because the existing tasks used in research focusing on passive

were either designed for comprehension (e.g., picture matching) or would not create enough linguistic contexts for rule application that would meet the acquisition criteria used in the PT framework. In the current task, participants were asked to describe a picture sequence which was specifically designed to elicit the Turkish passive construction.

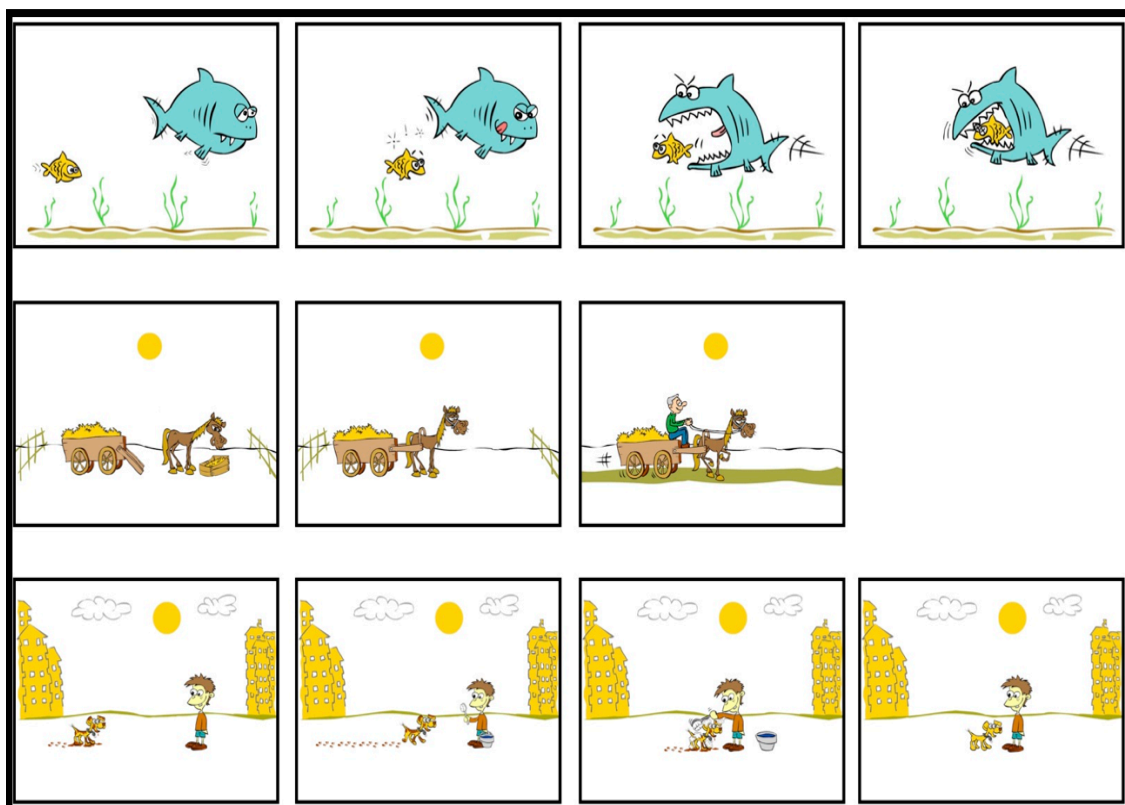
The design and the content of the experimental picture sequence used in the task were inspired by the original computer-animated fish film created by Tomlin (1995,1997).



**Figure 6.2:** The fish film event

The Fish Film was originally used to test the hypothesis that the syntactic subject assignment in English narrative may be explained as a reflex of focal attention. In the film, there is a set of eating events between two fish which are identical in shape and size but different in colour. The two fish enter the screen from opposite directions and meet at the centre of the screen, at which point one of them eats the other. In each scene, one of the fish (Agent or Patient) receives a visual cue: a flashing arrow accompanies one of the two fish in order to direct the participant's attention to one of the two fish the arrow points at. The instruction to the participants is to look at the fish that appeared with the cue throughout the trial and freely describe what they have observed. Analysis of the descriptions of the target event (one fish eating the other) showed that participants consistently assigned the cued reference to the sentential subject with the resulting structural frame dependent on which fish was cued. When the cue was on the Agent fish, participants produced active voice sentences (e.g., The blue fish ate the red fish); when cue was on the Patient fish, they produced passive voice sentences (e.g., The red fish was eaten by the blue fish). This

was found to be true in virtually 100 per cent of all experimental trials although two participants produced active voice sentences in both cueing conditions.



**Figure 6.3:** Passive elicitation task pictures

In the present task, the fish film was modified by replacing the film with fifteen events each consisting of three or four sets of picture sequences with different animate and inanimate characters (see Figure 6.3, and see Appendix F for the full picture set). This ensured that the communicative context created an abundant number of linguistic contexts for rule application to which the emergence criterion could be applied.

A typical dialogue between the researcher and the participant would look like this:

*Researcher: What do you see in the first picture?*

*Participant: There is a small fish and a big fish.*

*Researcher: What is happening in the second picture?*

*Participant: The big fish sees the small fish.*

*Researcher: And then?*

*Participant: The big fish wants to eat the small fish?*

*Researcher: What is happening to the small fish in the last picture?*

*Participant: The small fish is eaten by the big fish.*

By alternating the focus between the Agent and the Patient through questions and moving the FOCUS onto the Patient, the researcher aimed to create the optimum contexts where participants were expected to produce passive structures to describe the sequences.

### **6.3.3 Relative Clause Elicitation Task**

Because I could not find an existing communicative task that would elicit relative clauses easily from participants as young as those in my study, I designed this task myself. There are three techniques that are combined in the design of this particular task which uses spot-the-difference task layout. Spot-the-difference tasks use pictures that have predetermined identical and different parts (Gass & Mackey, 2007). A goal is set by asking participants to find the similarities and differences through verbal interaction. As there are two participants involved who have different sets of information to exchange, these tasks are also regarded as “two-way” tasks.

The first technique embedded in this task is known as elicited imitation which assumes that if a given sentence is part of a person’s grammar, it will be relatively easier to repeat, and if it is not a part of their grammar, then it will be difficult. Gass and Mackey (2007, p.27) note that elicited imitation is “beyond rote memory and repetition; rather, sentences are assumed to be filtered through one’s grammatical system”. These sentences are specifically to manipulate the targeted grammatical structures which will portray the participants’ internal grammatical systems when repeated accurately. The second technique is known as structured-elicitation which is used to observe the creative abilities of learners when confronted with rule-based morphological processes (Berman, 2000). In this task, the researcher provides the targeted verb or structure by describing a picture and then the participant describes a second picture using the same verb or structure.

The third technique is syntactic priming: the tendency of a speaker to generalise recently spoken or heard syntactic structures to his/her own utterances (Bock & Griffin, 2000). In priming experiments, two stimuli are presented successively, with the first being the prime and the second the target. The participants must

respond to the target in particular ways and priming is said to occur when the prime has an observable influence on the target. Priming in psychology refers to a finding in which exposure to a stimulus at time 1 influences the response to a related stimulus at time 2, and studies have identified that participants' verbalisation can be affected by a number of factors in the proceeding input (Gass & Mackey, 2000). The claim that is made to support the effect of priming is that it may facilitate the production of developmentally advanced and more appropriate structures, rather than less advanced structures.

In the task, the researcher interacted with participants over two pictures with predetermined similarities and differences (See figures 23 and 24, and Appendix G for larger versions). It contained elicited imitation as there were identical parts in each picture which required the researcher and participants to use certain structures. It was partially structured-elicitation because the researcher provided the targeted structure by describing a scene in the picture. It also contained priming as the researcher aimed to prompt the use of a relative clause which was mainly embedded in the questions and asked to note the similarities and differences. By doing so, a maximal linguistic context was created where the participants were warmed up to produce the form which they might not otherwise do.

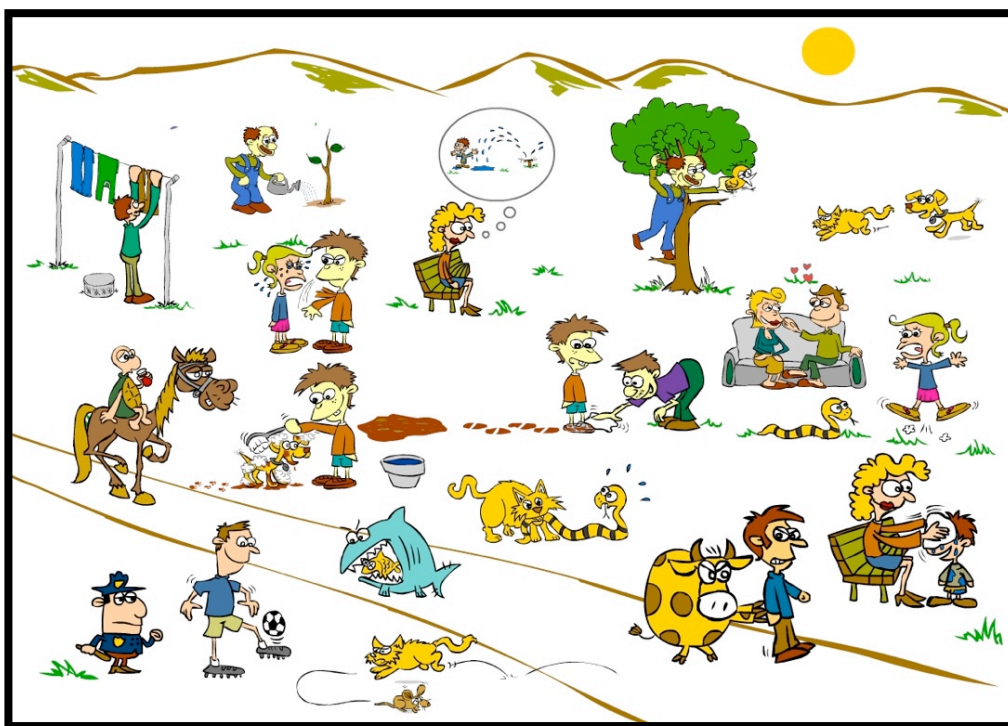


Figure 6.4. Relative clause elicitation task picture 1



**Figure 6.5.** Relative clause elicitation task picture 2

A typical dialogue between the researcher and the participant in this task would look like as follows:

*Researcher:* In your picture, is there a man who is watering the tree?

*Participant:* Yes. In yours, is there a cat that is chasing the mouse?

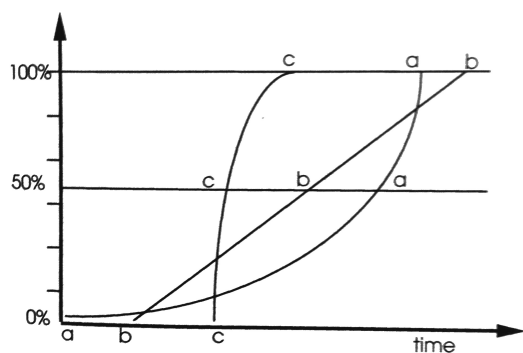
*Researcher:* Yes, there is a cat that is chasing the mouse. In your picture, is there a turtle that is sitting on a horse?

*Participant:* No. In your picture, is there a boy who is washing his dog?

#### **6.4 Acquisition criteria**

In many language acquisition studies, one common way of identifying the development is achieved by applying a percentage-based criterion level of accuracy for the use of a given grammatical structure in obligatory contexts. For instance, in some studies a grammatical feature is considered as “acquired” if it is used accurately in 90 per cent of the obligatory contexts (Brown, 1973; Dulay & Burt 1974, as cited in Ellis, 2000), while in another study acquisition is based on the criterion of 75 per cent accurate use (Ellis, 1988, as cited in Pallotti, 2007), and in Vainikka and Young-Scholten (1994) a structure is acquired when it is used 60 per cent accurately. Pienemann (1998b) argues that accuracy rates based on percentages is too arbitrary to be related to language development in

a linear manner and thus cannot serve as a valid acquisition criteria, which is illustrated in Figure 6.6.



**Figure 6.6:** Accuracy and development (Pienemann, 1998b, p.137)

In this figure, A, B and C are different grammatical structures whose rate of suppliance develops in different ways. What is more interesting according to Pienemann (1998b) is that a cross-sectional analysis at different rates would produce different accuracy orders. While at 1 per cent the accuracy order is 'a>b>c', it is 'c>b>a' at 50 per cent and 'c>a>b' at 90 per cent. This example illustrates that the criterion level used in percentage-based studies is based on arbitrary choices of threshold for capturing the mastery rates of grammatical structures without a theoretical justification (Pallotti, 2007). To overcome this arbitrariness and lack of theory, Pienemann (1998b, p.138) advocates operationalising a criterion of acquisition that is based on the emergence of grammatical structures, which, from a speech processing perspective, is "the point in time at which certain skills have, in principle, been attained or at which certain operations can, in principle, be carried out."

The emergence criterion looks at the first use of a given grammatical structure, which allows examining the acquisition of procedural skills required for producing that structure and its relation to the processing of other structures in an order. However, this is not a simple examination of whether a structure is used accurately by the learner or not. As we shall see in Chapter 8, accuracy order does not necessarily reflect acquisition order, and as Ellis (2000) argues the conclusions about acquisition order based on the assumption that learners who have acquired those grammatical features will perform more accurately is not justified. In this sense, while forming the acquisition order, the emergence criterion identifies the point of first systematic and productive use of a structure

in interlanguage development. Systematic use refers to the use of the same grammatical structure in a number of different contexts; and productive use refers to the lexical variation in the use of the same grammatical structure. Such an analysis can also rule out echoic use (i.e., repeating a structure from the other speaker's previous turn) or formulaic chunks with "refined analyses which neutralise the effect of unanalysed entries in the learner's lexicon" Pienemann (1998b, p.144).

The criterion employed in this study follows Pienemann's (1998b) formulation of emergence criterion in terms of morphological and lexical variation, which is that a given grammatical rule will be considered as acquired if it is used systematically and productively in at least four linguistic contexts. That is, at least one minimal pair of morphologically and lexically varied contexts is required to appear for a morphological structure to be regarded as emerged. For instance, the Turkish plural marking '-lar' needs to be found with different lexical items such as 'kurbaga-lar (frogs)', 'agaç-lar (trees)', 'köpek-ler (dogs)' and so on, but the lexical items also need to be used unmarked such as 'ev (house)', 'ari (bee), and so on. If the plural marking is found to be used with only one lexical item again and again, then this will be considered to be an indication of chunks as unsystematic and unproductive use. Thus, the emergence criterion, as Pienemann (1998b, p.144) proposes, allows for analysing the language production systematically as a unique system without relying on arbitrarily chosen percentage-based criteria for rule suppliance in obligatory contexts as defined by the target grammar. In the application of the emergence criterion, the raw data are subject to two stages of interpretation; distributional analysis and implicational scaling (Pienemann, 1998b, p.144-153).

#### **6.4.1 Distributional Analysis**

According to Pienemann (1998), there are four categories regarding the quantitative observations of the rule application in the interlanguage grammar: "(1) no evidence, i.e. no linguistic contexts; (2) insufficient evidence, i.e. very small number of contexts; (3) evidence for non-application, i.e. non-application in the presence of contexts for rule x; and (4) evidence of rule application, i.e. examples of rule application in the presence of contexts" (p.146). According to Di Biase (1998), while the first two categories are inconclusive as they may

create ambiguities, the last two help reaching a reliable understanding of the learner's current state of grammar. Thus, this study mainly makes use of categories (3) and (4) as the current state of the learner's grammar can be most reliably seen if the data contains as many of these two observations as possible (Pienemann, 1998b).

In PT, the discussion of the acquisition criterion is constructed on converting quantitative data into qualitative data (Pienemann, 1998b). This is achieved by two steps. In the first step, a distributional analysis is carried out which is a detailed linguistic account of the contexts in which a morpheme is produced. According to Pienemann (1998b, p.149), distributional analysis is superior to arbitrary quantitative data since it is possible for researchers to "trace every step in the development of the relationship between grammatical forms and their functions from the first emergence of the most modest (non-standard) systematicity to the full use of the target language system." Once the distributional analysis is produced, the emergence criterion is then applied to the results obtained via distributional analysis, which is translated into implicational scaling. It is the implicational analysis that determines the systematic relationship between different grammatical structures that emerge in the interlanguage.

#### ***6.4.2 Implicational Scale***

Meisel, Clahsen and Pienemann (1981) argued that in most cross-sectional studies, learners' language developmental is assumed to progress in a linear and uniform fashion, where each systematic variation represents a new developmental stage based on an order of arbitrary accuracy rates achieved by comparing their speech with the target language norms. The underlying assumption in the accuracy order is that the more accurately a grammatical structure is used by a number of learners during data collection, the earlier it is acquired than the structures they use less correctly. However, accuracy order "does not have the potential of describing the dynamics of interlanguage development" (Pienemann, 1998b, p. 137) since it cannot capture the linguistic variation in learners' interlanguage as a unique system or provide convincing evidence for the hierarchical sequence of rule acquisition (Meisel et al., 1981).

Meisel et al. (1981) investigated the natural development of word order in German L2 in a study which consisted of both longitudinal and cross-linguistic data. They used the longitudinal approach to provide “convincing evidence for developmental stages in language acquisition” (Meisel et al., 1981, p.112), and cross-sectional approach to investigate linguistic variation in the learner interlanguage. By using a different approach to their analysis of both data sets, namely implicational scaling, based on the linguistic description of grammatical rules, Meisel et al. (1981) provided empirical evidence that there were five developmental stages in German word order, which were implicationally and hierarchically related. That is, the results showed the learners who produced Stage 5 structures were also able to produce other structures from lower stages. By this approach, the unique interlanguage system of learners was also disentangled from the target language norm as it captured the linguistic variability across learners.

Implicational scaling (DeCamp, 1973; Guttman, 1944, as cited in Pienemann, 1998b) is regarded as a very effective and powerful technique to visually represent language development over time or at a point in time. It is utilised as a tool for examining the hypothesised hierarchical relationship in the acquisition of different grammatical structures instead of an analysis that is based on the difficulty of those structures. The basic notion is that if learners can process rule 5, then they can also produce rules 4, 3, 2 and 1. This cumulative process of learning is illustrated in Table 6.2, where “+” means the appearance of the structures in accordance with the emergence criterion, and “-” means the absence of those structures.

**Table 6.2:** Implicational scale

	time 1	time 2	time 3	time 4	time 5
rule 1	+	+	+	+	+
rule 2	-	+	+	+	+
rule 3	-	-	+	+	+
rule 4	-	-	-	+	+
rule 5	-	-	-	-	+

(adapted from Pienemann, 1998b, p.134)

This table shows the implicational relationship between the rules 1, 2, 3, 4 and 5 in a developmental sequence within a given time period, as in longitudinal studies. By implicational scaling, it is possible to observe the complex accumulative process of language acquisition. Implicational scaling is also a robust tool to account for cross-sectional data. In such analyses, the time axis is replaced by an informant axis, which allows the implicational pattern of the rules to be empirically examined. Pienemann (1998b) proposes that, in the same cumulative fashion, interlanguage samples collected from different informants at one point in time can be used to represent the implicational relationship of the individual rules, which is illustrated in Table 6.3:

**Table 6.3:** Implicational scale for cross-sectional data

	informant 1	informant 2	informant 3	informant 4	informant 5
rule 1	+	+	+	+	+
rule 2	-	+	+	+	+
rule 3	-	-	+	+	+
rule 4	-	-	-	+	+
rule 5	-	-	-	-	+

(adapted from Pienemann, 1998b, p.134, 135)

If such an implicational scale is achieved as a result of the analysis, then one can hypothesise the chronological development of rules 1 to 5 even in a cross-sectional study, which means that the existence of a later rule (e.g., rule 5) in the interlanguage indicates that existence of earlier structures too (e.g., rules 4, 3, 2 and 1).

The two tables above demonstrate a very clear and perfect implicational scale, which would allow the researcher to make predictions about the performance of other informants. However, not all analyses result in with a perfect implicational scale, and some may have “errors”. In implicational scales, when participants perform against our predictions (e.g., knowing something we didn’t predict they would and vice versa), it is called “error” (Hatch & Lazaraton, 1991). This sort of deviation from the perfect model can be seen in the following table:

**Table 6.4:** Implicational scale for cross-sectional data with “error”

	informant 1	informant 2	informant 3	informant 4	informant 5
rule 1	+	+	+	+	+
rule 2	-	+	+	+	+
rule 3	+	-	+	+	+
rule 4	-	-	-	+	+
rule 5	-	+	-	-	+

In Table 6.4, informant 1 has acquired rules 1 and 3, however, s/he has not acquired rule 2. Similarly, informant 2 has acquired rules 1, 2 and 5, but not rules 3 and 4. Calculating the number of errors is crucial for the reliability of the implicational scaling since the predictive power, or “the degree to which the data fit the idealised model” relies on the degree of error (Hatch & Lazaraton, 1991, p. 207).

As proposed by Hatch and Lazaraton (1991, p. 210-212), there are three statistical procedures to follow while verifying the reliability of the hypothesised cumulative patterns found in implicational scales, which are the *coefficient of reproducibility*, the *minimum marginal reproducibility*, and the *percent improvement in reproducibility*. These procedures allow us to determine the *coefficient scalability*.

The first one, the *coefficient of reproducibility*, shows how well an informant’s performance can be predicted from his/her position in the matrix. The formula is to calculate this is as follows, where ‘Ss’ represents ‘students’

$$C_{rep} = 1 - \frac{\text{number of errors}}{(\text{number of Ss})(\text{number of items})}$$

(Hatch & Lazaraton, 1991, p. 210)

In the example presented in Table 6, there are 5 informants and 5 rules (or items) with a total of 2 errors. Thus:

$$C_{rep} = 1 - (2 / (5 \cdot 5))$$

$$C_{rep} = .92$$

This figure means that 92 per cent of the time, it can be accurately predicted which rules an informant can produce correctly by his/her rank in the matrix. Hatch and Lazaraton (1991, p.210) assert that mathematically if value of over .90 coefficient reproducibility is achieved, it is considered as “valid”. The second statistical calculation, the *minimum marginal reproducibility*, tells the rate of predictability without taking the errors into account, whose formula is as follows:

$$MM_{rep} = \frac{\text{maximum marginals}}{(\text{number of Ss})(\text{number of items})}$$

(Hatch & Lazaraton, 1991, p. 211)

Maximum marginals is the totals of rules emerged at the bottom of each column. According to Table 6, then:

$$\text{maximum marginals} = 17$$

$$MM_{rep} = 17 / (5.5)$$

$$MM_{rep} = .68$$

Hatch and Lazaraton (1991, p. 211) note that this value should be less than the value of the coefficient of reproducibility for the data. The third procedure, the *percent improvement in reproducibility*, shows the amount of improvement between the coefficient of reproducibility and the minimal marginal reproducibility. The formula is shown as follows:

$$\% \text{ improvement} = C_{rep} - MM_{rep}$$

(Hatch & Lazaraton, 1991, p. 211)

For our analysis, the percent improvement in reproducibility is:

$$\% \text{ improvement} = .92 - .68$$

$$\% \text{ improvement} = .24$$

Now that we have all the figures, we can determine the reliability of the developmental order presented in Table 6 via calculating the *coefficient of scalability*. This is calculated by using the following formula:

$$C_{scal} = \frac{\% \text{ improvement in reproducibility}}{1 - MM_{rep}}$$

(Hatch & Lazaraton, 1991, p. 212)

This equation takes into account the percent improvement and the minimum marginal reproducibility. For Table 6, it works out as follows:

$$C_{scal} = .24 / (1 - .68)$$

$$C_{scal} = .75$$

From a statistical point of view, the coefficient of scalability must be above .60 for an implicational scale to be claimed with scalability (Hatch & Lazaraton, 1991, p. 212). Thus, our implicational scale presented in Table 6 has a high coefficient of scalability with the value of .75, which indicates a strong representation of developmental pattern.

Various studies have provided empirical evidence for the reliability of implicational scaling in identifying the cumulative nature of language development in cross-linguistic studies (Di Biase & Kawaguchi, 2002; Kawaguchi; 2000; 2010; Pienemann, 1998b; Pienemann, Johnston & Brindley, 1988; Rahkonen & Håkansson, 2008). Thus, I believe that the technique of implicational scaling for analysis of the data in this study is both descriptively and statistically reliable and falsifiable. If the analyses demonstrate a statistically valid implicational hierarchy, then the hypothesised developmental hierarchy for Turkish grammatical structures can be empirically supported, upon which a discussion of incomplete acquisition can be built. Moreover, to my knowledge, no heritage language study or Turkish language acquisition study has used a type of data analysis that is both theory-driven and statistically reliable.

In the next chapter, I will present the quantitative distributional analyses of the data and the qualitative implicational analysis obtained by applying emergence criterion. This will be followed by an overview of the data highlighting the interlanguage variability based on PT's processing mechanisms and Hypothesis Space (Pienemann, 1998b).

## Chapter 7. Results

This research study aimed at answering three questions formulated in Chapter 6. The first question deals with hypothesising a developmental hierarchy of Turkish for a number of grammatical structures. This was achieved by analysing the targeted structures regarding the LFG (Bresnan, 2001) formalisms and predicting their hierarchical order within developmental stages according to their processing procedures as explained within the framework of Processability Theory (Pienemann, 1998b; Pienemann et al., 2005), which, as mentioned above, is a novel contribution.

The second question concerned the level of acquisition of Turkish by heritage speakers, which inherently forms a platform to empirically justify the predictions made as an answer to the first question. The third question is related to the theoretical contributions of PT to our understanding of incomplete language acquisition by heritage speakers. The answer to the second questions also provides the basis for an answer to third question, which will be dealt with in Chapter 8 in relation to the existing proposals in the literature. This was achieved by analysing the heritage speaker data according to the emergence criterion to see whether the implicational relationship between different grammatical structures would fit within the predictions on the developmental hierarchy of Turkish. All tokens of morphosyntactic structures discussed in Chapter 5 were calculated and analysed according to PT's emergence criterion of minimal pairs (Pienemann, 1998b), taking into account morphological and lexical variation for the production of any given grammatical structure. That is, if there are at least three rule applications for a grammatical structure in four different linguistic contexts with varying lexical items, then that grammatical structure is considered as acquired by that participant.

This chapter is structured as follows: first, the overall analysis of the data is presented in section 7.1, which addresses research question 1. In the following sections (7.2 -7.6) interlanguage variability is examined following PT's hierarchy of processing stages to address research question 2. The evaluation of the data to examine the specific nature of incomplete heritage language acquisition according to the PT perspective (research question 3) in comparison with the existing literature will be presented in the following chapter.

## 7.1 A processability perspective on the data

The quantitative analysis of the data presented in the tables below is used to provide an indication of dynamic system of participants' language development; however, PT does not rely on quantitative measures as a criterion for acquisition (Mansouri, 2005). Instead, quantitative data is transformed into qualitative analysis by careful analysis of the linguistic contexts through the application of the emergence criterion (Pienemann, 1998b). As discussed in the previous chapter, in order for the emergence criterion to be met, participants are required to produce a given grammatical structure with varying lexical items in at least four different linguistic contexts (Pienemann, 1998b).

The analysis of the data focused on two linguistic phenomena separately, namely morphosyntactic rules and word order rules, which then were combined to illustrate the overall linguistic development of participants. The first table (Table 7.1) below is an implicationally scaled quantitative analysis of the distributional analysis for the target morphosyntactic structures in terms of their presence and absence out of the total amount of linguistic contexts. As discussed in the previous chapter, implicational scaling enables the data elicited from a number of participants at one point in time (cross-sectionally) to be interpreted to check the cumulative nature of language development among the participants (Hatch & Lazaraton, 1991; Pienemann, 1998b).

In Table 7.1, the first column 'PT stages' lists the grammatical structures identified according to PT stages. The linguistic analysis of these grammatical structures and their processing procedures were discussed previously in Chapter 5. Each column on the right represents the individual participants. The cells include the following information: single slash (/) only in one cell represents that participants did not produce any linguistic context of that grammatical structure. In other cells, the figure before the slash (/) represents the total number of rule application for that grammatical structure while the figure after the slash (/) represents the total number of linguistic contexts for the same grammatical structure. For example, P5 produced the Passive (NST) in 1 out of 8 contexts in total (1/8). According to the emergence criterion, this was regarded as unproductive and unsystematic since the design of the passive elicitation task created the communicative context for the application of the linguistic rule.

**Table 7.1: Distributional analysis of morphosyntax for all participants in the order predicted**

PT stages	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24
5	Rel. Clause 0/11	0/10	0/11	0/13	0/13	0/10	0/10	1/10	0/15	0/13	0/14	0/12	0/10	0/10	0/13	0/13	0/13	0/10	0/10	0/13	0/10	3/14	7/13	5/13
4	Pass. (ST) 0/10	0/10	0/10	1/10	0/10	0/10	0/10	1/10	1/10	0/10	0/10	1/10	1/10	1/10	0/10	2/10	3/10	3/10	3/10	4/10	5/10	4/10	4/10	5/10
3	Verb comp. /	/	/	1/1	6/6	6/6	6/7	6/6	7/7	15/25	5/5	5/5	5/5	23/23	7/7	7/7	8/8	5/5	10/10	8/8	5/5	11/11	24/24	10/10
	Gen- Poss 1/6	1/3	7/7	13/15	10/10	6/7	5/8	6/6	5/5	11/14	11/12	12/12	12/12	18/18	15/15	11/12	19/19	11/11	9/10	15/15	7/7	12/12	20/20	17/17
2	Pass. (NST) 0/8	1/8	3/8	5/8	1/8	1/8	2/8	2/8	2/8	3/8	4/8	4/8	4/8	4/8	5/8	3/8	4/8	4/8	5/8	6/8	4/8	5/8	4/8	5/8
	Tense/ aspect 64/68	106/106	146/146	133/133	107/107	94/94	123/123	56/56	109/109	152/152	114/114	145/145	164/164	193/193	136/136	130/130	191/191	139/139	116/116	160/160	152/152	153/153	217/217	174/274
	Person 62/68	106/106	146/146	133/133	107/107	94/94	123/123	56/56	109/109	152/152	114/114	145/145	164/164	193/193	136/136	130/130	191/191	139/139	116/116	160/160	152/152	153/153	217/217	174/174
	Plural 9/9	7/7	12/12	4/4	10/10	6/6	6/6	4/4	6/6	9/9	6/6	8/8	8/8	7/7	10/10	9/9	4/4	7/7	5/5	7/7	7/7	10/10	11/11	5/5
Case 21/37	18/35	72/74	19/25	48/50	51/51	48/56	36/38	48/51	76/80	65/65	84/87	91/94	104/104	106/106	66/66	97/97	68/68	55/55	87/87	59/59	77/77	115/115	85/85	

However, the same participant, P5, produced the genitive-possessive marking in 10 out of 10 contexts (10/10), with different lexical items. For this construction, the participant's rule application met the emergence criterion. For relative clause, P22, for instance, has produced 3 grammatically correct relative clauses out of 14 linguistic contexts. However, these were the clauses that mirrored the researcher's models. Therefore, P22 is marked with "-" in the implicational scale indicating unsystematic and unproductive use.

As mentioned earlier in the methodology chapter (Chapter 6.3), passives and relative clauses are alternatives to simpler forms. Although they may convey the same semantic context, simpler forms and more complex forms may carry different discourse-pragmatic functions. Given that some grammatical phenomena such as passives and relative clauses may not be particularly frequent in spontaneous speech, simply relying on the data gathered from spontaneous speech would not give sufficient data to reach conclusive analysis. While the Frog Story may give some speakers the chance to spontaneously produce some of these structures, the specific tasks used for eliciting passives and relative clauses in this study ensured that I could diagnose fairly the linguistic capacity of all the participants to produce certain grammatical phenomena by creating the optimum communicative context. By applying the emergence criterion to the production of these grammatical features and constructions in Table 7.1, we can interpret an implicational table (Table 7.2) which clarifies the cumulative process and developmental hierarchy of morphosyntactic structures in the participants' interlanguage. In Table 7.2 below, [+] represents the participants met the emergence criterion of morphological and lexical variation in different linguistic contexts. While [-] represents non-emergence of given structures, [/] represents that participants did not produce linguistic contexts where those grammatical structures can be applied.

The statistical reliability of the scale was calculated according to the formulae presented in Chapter 6. In total, there are five "errors" (P5-P9 for PASS/NST), which do not fit the overall implicational model. Thus, the *coefficient of reproducibility* of the scale is .98, which means 98 per cent of the time we can

**Table 7.2:** Application of emergence criterion to raw data

PT stages	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24
5	Rel. Clause	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Pass. (ST)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Verb comp.	/	/	/	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Gen-Poss	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2	Pass. (NST)	-	-	+	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Tense/aspect	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Person	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Plural	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Case	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

predict accurately which rules the participants can produce according to their rank in the matrix. As stated earlier, over .90 value for coefficient reproducibility is statistically valid (Hatch & Lazaraton, 1991, p.210). The *minimum marginal reproducibility* of the scale is .75, which is less than the *coefficient of reproducibility* (.98), and the *percent improvement in reproducibility* is .23. Overall, the *coefficient of scalability* is .92, which is statistically required to be over .60. Thus, the implicational scale presented in Table 7.2 has a very high statistical value of scalability, which indicates a strong implicational relationship between the developmental stages of morphosyntactic rules.

As for the word order and the mapping of discourse functions, which are analysed in Table 7.3 and Table 7.4, although the data set is inconclusive due to the fact that there was an insufficient amount of evidence in the data for an overall evaluation - especially for Object Topicalisation, the analysis of the structures that exist in the data can still reveal information about the linguistic repertoire of the participants. As discussed above in Chapter 5, the seemingly free word order in Turkish is restricted due to pragmatic conditions, which I analysed according to PT's mapping principles and demonstrated that certain deviations from the unmarked word order SOV required the availability of procedural skills to associate discourse functions with different grammatical functions other than Subject.

At this point it is important to remember that the main focus of this study is not the relationship between word order and the acquisition of discourse functions; however, as is obvious from Table 7.3 below, the majority of heritage speakers used the default word order of Turkish (SOV) in the story narration task. In Chapter 5, it was shown that the sentence-initial position in Turkish was the default position for Topic. In Table 7.3 below, the figures before the slash represent the lexical variability and the figures after the slash represent the linguistic variability. For instance, in ADJ+SOV construction, P14 produced 15 constructions with linguistic variability that had an Adjunct in sentence-initial position, and 3 out of 15 were lexically different Adjuncts. A single slash without brackets “ / ” in a cell means there is no rule application or linguistic context for that structure.

**Table 7.3:** Distributional analysis of discourse function mapping for all participants in the order predicted by PT

PT stages	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24
3 ADJ + SOV	/	1/8	1/7	1/1	3/7	3/5	1/1	/	2/6	3/8	/	3/15	3/8	3/15	2/2	1/2	3/9	3/8	2/5	3/7	3/11	4/10	3/15	4/12
2 (S)OV	68/68	104/104	140/140	120/120	107/107	94/94	110/110	50/50	95/95	129/129	102/102	121/121	164/164	163/163	1110/1110	110/110	170/170	130/130	116/116	150/150	152/152	153/153	217/217	164/164

**Table 7.4:** Application of emergence criterion to word order and discourse

PT Stages	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24
3 ADJ + SOV	/	-	-	()	+	+	()	/	+	+	/	+	+	+	()	()	+	+	+	+	+	+	+	+
2 (S)OV	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

We can still apply the emergence criterion to the distributional analysis presented in Table 7.3, to check if there is an implicational relationship between the structures present in the data. Given that the aim of applying the emergence criterion to data is to find out whether a grammatical structure has been used productively and systematically, and that the use of ADJ+SOV or OSV were optional in the tasks, any of these structures is considered to be productively used if there are at least two lexical items in at least four contexts (Pallotti, 2007). This will also prevent the potential use of chunks and non-productive application of rule. Table 7.4 illustrates the application of emergence criterion to the distributional analysis presented in Table 7.3. Since there are no “errors” against the implicational model in the table, the scalability is statistically valid, with the values of *coefficient of reproducibility* and *coefficient of scalability* both being 1.00.

In Table 7.5, [+] represents that the emergence criterion has been met. While the slash “/” represents that there were no linguistic contexts for that rule, the slash in brackets “(/)” represents that participants did not produce the required amount of linguistic contexts for the rules to meet the emergence criterion. If participant applied the rule with one lexical item in various context, this was considered as non-productive, and marked with “-” on the implicational table. For instance, P2 and P3 only used the adverb *simdi* ‘now’ in sentence-initial position, which was echoed from the researcher during the task completion. So this was regarded as an unproductive use. If a participant applied the rule once with one lexical item in insufficient numbers of contexts, this was regarded as undetermined and marked with “(/)” on the table. For instance, P4 and P7 applied Adverb fronting only once in only one context. It is undetermined since it is not clear whether the participant does not have the required processing mechanisms for generating that structure or whether the design of the task does not focus on eliciting that type of structure. In this study, it is the latter that resulted in an inconclusive data set. However, the data still exemplify typical language development across different individuals, where some do not produce any rule or linguistic context for that rule; some produce the rule with an insufficient number of linguistic contexts; and some produce the rule in lexically and linguistically varied contexts as put forward by emergence criterion.

**Table 7.5:** Application of emergence criterion to overall distributional analysis

PT stages	P1	P2	P3	P4	P8	P11	P7	P15	P16	P5	P6	P9	P10	P12	P13	P14	P17	P18	P19	P20	P21	P22	P23	P24
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	/	-	-	(/)	/	/	(/)	(/)	(/)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	/	/	/	/	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	-	-	+	+	-	+	-	+	+	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Rel. Clause																								
Pass. (ST)																								
ADJ SOV																								
Verb comp.																								
Gen-Poss																								
Pass. (NST)																								
Tense/aspect																								
Person																								
Plural																								
Case																								
(S)OV																								

The empirical results achieved by implicational scaling show that the observed developmental path for Turkish heritage speakers is compatible with the hypothesised predictions of developmental hierarchy for Turkish grammatical structures based on PT's processing mechanisms. The results also confirm the typological plausibility of PT. When two implicational tables are combined according to the predictions for Turkish within PT, it is seen in Table 7.5 above that the five developmental stages predicted for Turkish grammatical structures within PT were observed among the heritage speakers of Turkish who participated in this study and shown to have a statistically very high scalability ( $C_{scal} = .96$ ).

In the light of these findings, only two participants, P23 and P24, reached the predicted highest stage of the Turkish developmental hierarchy, which is hypothesised according to PT's processing mechanisms (Pienemann, 1998b; Pienemann et al, 2005). For the rest of the participants not all of the structures have fully emerged and their developmental rank in the predicted hierarchy varied from Stage 2 to Stage 4. This can be considered to have resulted from heritage speakers' lack of necessary procedural skills.

The phenomenon of incomplete acquisition is the concern of the third research question, whose nature will be addressed in the following chapter from the perspective of previous studies and that of PT. Before doing this, I will present the interlanguage variability among participants through some extracts from the data to exemplify what kind of structures participants produced for the procedures hierarchically hypothesised in Chapter 5, with a focus on the required processing procedures for the target structures (.i.e., category, phrasal, inter-phrasal and inter-clausal). I also refer briefly discourse functions because the analyses reveal that the ability to scramble word order seems to be constrained by the availability of procedural mechanisms necessary for making associations between discourse functions and grammatical functions.

## **7.2 Category Procedure**

PT predicts that language learners who are at Stage 2 are able to generate canonical word order as explained in the Unmarked Alignment Hypothesis (Pienemann et al., 2005) as well as lexical procedures that do not involve

feature unification between or within the constituents in their structural context. Overall, all participants were able to operate these procedural skills that are required for producing basic nominal and verbal morphology productively and accurately, marking case and plural on the noun; and person and tense on the verb. The pro-drop feature of Turkish was also used by all of the participants as seen in the following examples:

(7.1) P16

Task: Frog story

Structures: case, plural, tense, person, SOV

*Köpek            ari-lar-a            kiz-iyor.*

Dog            bee-PLU-DAT            annoy-PRE-(3SG).

'The dog is annoyed at the bees.'

(7.2) P03

Task: Frog story

Structures: tense, person, pro-drop

*Cam-dan            bak-iyor.*

Window-ABL            look-PRE-(3SG).

'He is looking out of the window.'

(7.3) P18

Task: Frog story

Structures: tense, person, pro-drop

*Otur-uyor.*

Sit-PRE-(3SG)

'He is sitting.'

(7.4) P09

Task: Passive

Structures: person, tense, pro-drop, passive (NST)

*Temizle-n-di.*

Clean-PASS-PAST-(3SG).

'He got cleaned'

### 7.3 Phrasal Procedure

Apart from P01, P02 and P03, all other participants were able to produce structures situated at Stage 3 which, as predicted by PT (Pienemann 1998, 2005) require exchange of grammatical information between the constituents within the same phrase. As discussed in Chapter 5, in Turkish this kind of procedure can be observed in the construction of verb complements and genitive marking on possessive noun phrases.

#### (7.5) P20

Task: Frog Story

Structure: genitive-possessive

*Köpek şimdi ari-lar-in ev-i-ne bak-iyor.*

Dog now bee-PLU-GEN house-POSS-DAT look-PRE(3SG)

'The dog is looking at the bees' house now.'

#### (7.6) P4

Task: Frog Story

Structure: Genitive-possessive

*Kopeğ-in kafa-si sise-de.*

Dog-GEN head-POSS bottle-LOC-(EXIST).

'The dog's head is in the bottle.'

#### (7.7) P24

Task: Frog Story

Structure: Verb comp.

*Ev-i-ne git-mek isti-yor.*

House-POSS-DAT go-INF want-PRE-(3SG).

'S/he wants to go to her/his house.'

#### (7.8) P23

Task: Frog Story

Structure: Verb comp.

*Kurbaga kavanoz-dan cik-ma-ya calis-iyor.*

Frog jar-ABL leave-INF-DAT try-PRE-(3SG)

'The frog is trying to leave the jar' (The frog is trying to get out of the jar.)

(7.9) P21

Task: Frog Story

Structure: ADJ = TOP + SOV

*Simdi ari-lar köpeg-e saldir-iyor-lar.*

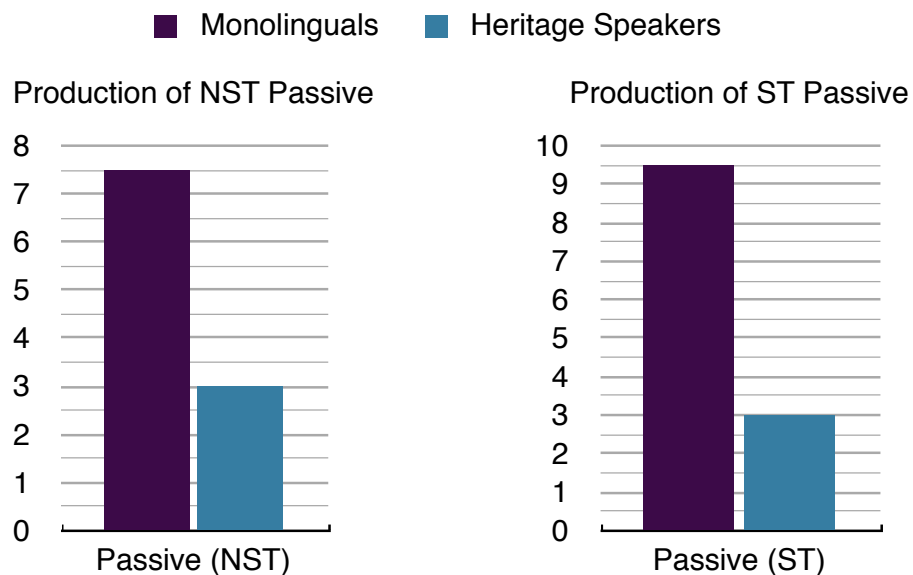
Now bee-PLU dog-DAT attack-PRE-3PLU

'Now the bees are attacking the dog.'

#### 7.4 Inter-phrasal Procedure

In the study, it was observed that the lower level heritage speakers could not implement the instructional and contextual cues for the production of passive that required non-linear mapping of a-structure to f-structure as discussed in the LFG analysis (Chapter 5). Instead, they used the active constructions where thematic roles are mapped to grammatical functions canonically. This represents that the alternative structures that were produced were constrained by the processing capacity. The advanced speakers were able to produce passives with non-linear mapping of a-structure to f-structure. A distributional analysis of the passive production task can be seen above in Table 7. The column "Passive NST (Non-suppressed thematic argument)" represents the type of passive that is constructed by a linear mapping of a- to f-structure as in '*Köpek yıka-n-iyor*' (*Dog bathe-PASS-PRE = The dog is bathing*). The column "Passive ST (Suppressed thematic argument)" represents the type of passive that requires non-linear mapping of a- to f-structure as in '*Kiz öp-ül-üyor*' (*Girl kiss-PASS-PRE = The girl is kissed*).

On average, in both types of passives heritage speakers produced fewer passives than the native speaker control group:



NST = Non-thematically suppressed passives (linear mapping of a- to f-structure)

ST = Thematically suppressed passives (non-linear mapping of a- to f-structure)

**Figure 7.1:** Average number of passive production

In Figure 7.1, the first chart “Production of NST Passive” represents the average number of linearly mapped passives. All monolingual participants responded with an NST passive sentence to each of the eight prompts in the task, while heritage speakers produced only 3 NST passive structures on average when prompted. In the “Production of ST Passive” chart, all of the monolinguals and only nine of the heritage speakers are represented as they were only ones who produced ST passives productively according to emergence criterion. As the chart illustrates, those nine heritage speakers produced only three ST passives despite being prompted ten times.

In the task, heritage speakers generally resorted to alternative ways of expressing the Agent-Patient relationship in events depicted in the task pictures, which shows the current state of the procedural skills they acquired so far. One of the alternative structures frequently used by them was sentences with canonical mapping of a- to f-structure, which is illustrated in the following extracts from the data.

In this instance, pictures depict a boy approaching a girl and kissing her (see Appendix F)

Researcher: *Kiz ne oluyor?*

Girl what happen-PRE-(3SG)

“What is happening to the girl?”

(7.10) P19: *Oglan bir öpücük veri-yor kız-a.*  
Boy a kiss give-PRE-3SG girl-DAT  
“The boy is giving a kiss to the girl.

However, in the same picture prompt, monolingual participants responded with a passive sentence, as in the following extract:

(7.11) P25 (monolingual): *Kız öp-ül-üyor.*  
Girl kiss-PASS-PRE  
“The girl is being kissed”

In another picture set, there is a cow standing in the middle of a road and a man pushes it off to the side of the road (see Appendix F).

Researcher: *Burda inek ne ol-uyor?*  
Here cow what happen-PRE-(3SG)  
“What is happening to the cow here?”

(7.12) P14: *Adam o-nu it-iyor.*  
Man he-ACC push-PRE-(3SG)  
“The man is pushing it.”

Again, in the same picture prompt, monolingual participants responded with a passive sentence, as in the following extract:

(7.13) P26 (monolingual): *Inek it-il-iyor.*  
Cow push-PASS-PRE-(3SG)  
“The cow is being pushed.”

Alternatively heritage speakers used adjectives to describe the state of the Patient, rather than describing the event by using passive.

Researcher: *Oglan-a ne ol-uyor?*  
Boy-DAT what happen-PRE-(3SG)  
“What is happening to the boy?”

(7.14) P07: *Oglan ıslak.*  
Boy wet-(EXIST)-(3SG)

“The boy is wet”

Researcher: *Tavsan-a ne ol-uyor?*

Rabbit-DAT what happen-PRE-(3SG)

“What is happening to the rabbit?”

(7.15) P06: *Öl-dü tavsan.*

Die-PAST rabbit.

“The rabbit died / The rabbit is dead.”

At times participants started with the Patient in the sentence-initial position, which can be seen as an effort to produce a passive but then reversion back to the canonical order where Agent is mapped to the Subject.

Researcher: *Burda araba ne ol-uyor?*

Here cart what happen-PRE-(3SG)

“What is happening to the cart here?”

(7.16) P20: *Araba... simdi at o araba-yi cek-iyor.*

Cart now horse that cart-ACC pull-PRE-(3SG)

“Cart... now the horse is pulling that cart.”

The results support the predictions made based on the PT framework. At lower stages, speakers can only produce sentences where predicate arguments (Agent and Patient) are canonically mapped onto grammatical functions (Subject and Object). This also shows that they have not acquired the necessary procedural skills to produce structures which deviate from the canonical mapping of semantic roles onto grammatical functions.

## 7.5 Subordinate Clause Procedure

As analysed in the LFG chapter (Chapter 5), the relationship between the head noun and the gap in Turkish relative clause is signalled by unique morphological suffixes and is handled by long-distance dependency rules based on functional uncertainty. The nominalised verb is obligatorily in the immediate pre-noun position, which can be regarded as SUBJ-VERB inversion.

Although all participants were given the same picture in the relative clause elicitation task, the number of questions (linguistic contexts) each participant used to complete the task varied between 10 and 14. It was observed that majority of heritage speakers were more sensitive to verbal morphology than they were to word order. Although the subject relativisation suffix (-an) is a unique morpheme and signals long-distance dependencies based on functional uncertainty in Turkish relative clauses, heritage speakers' ability to use it without correct word order (Subj-Verb inversion) may not necessarily show that they have acquired those procedural skills to handle such grammatical complexities licensed by long-distance dependencies and functional uncertainty. Instead, it seems that heritage speakers' use of relativised verbs without correct word order is a result of their linguistic knowledge of the general architecture of Turkish grammar. The agglutinative nature of Turkish grammar, especially for basic structures (i.e., Case, Person, Tense), is acquired at very early ages of language development (before the age of 2), which gives the learner the ability to analyse the verb stem and affixes attached to it. This is also observed among heritage speakers in this study (see Table 7.1 Distributional Analysis presented earlier in this chapter). Thus, in the relative clause task, heritage speakers were able to recognise the relativised verbs in the model sentences provided by the researcher, and occasionally were able to apply the rule without demonstrating the productive use of the rule determined according to the emergence criterion which requires at least four rule application in lexically different contexts. Instead of using relative clauses that required the subordinate clause procedure, the majority of the heritage speakers used two individual clauses that are semantically connected through discourse-pragmatic context but structurally do not show the grammatical context that required exchange of grammatical information between the two clauses. This issue can be seen in the following examples:

(7.17) P05: *Senin resim-de bir tavsan var mi? Köpek*  
 Your picture-LOC one rabbit exist Q? Dog  
  
*tavsan-i isir-iyor.*  
 Rabbit-ACC bite-PRE-3SG

'In your picture, is there a rabbit? The dog is biting the rabbit.'

(7.18) P08: *Sen-de bir tane adam var mi? Kopeg-i*  
You-LOC a single man exist Q dog-ACC

*kurulu-yor.*

dry-PRE-(3SG)

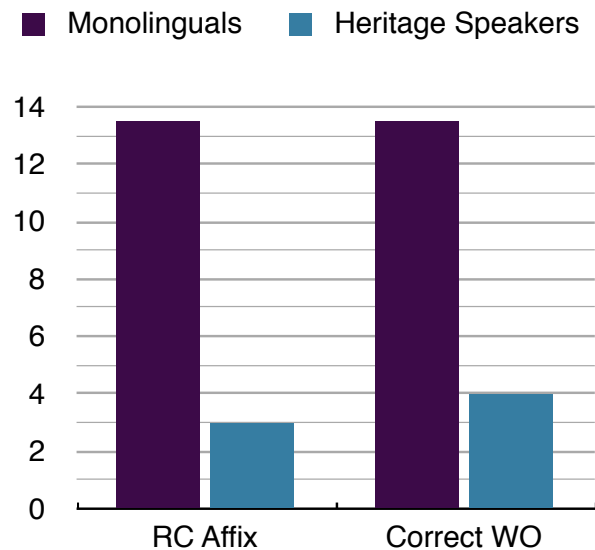
‘In yours, is there a man? He is drying the dog.’

While the two independent clauses in each example are grammatically correct and demonstrate the procedural skills of the participants (P05, P08), another participant who have acquired the procedural skills necessary for processing relative clauses produced the following sentence for the same stimulus in (7.17):

(7.19) P24: *Senin resim-in-de tavsan-i isir-an bir köpek*  
Your picture-POSS-LOC rabbit-ACC bite-S.REL one dog  
*var mi?*  
exist Q?

‘In your picture, is there a dog that is biting the rabbit?’

In terms of the application of the rule in correct word order, the number of relative clauses produced by heritage speakers differed markedly from that of monolinguals, which is illustrated in the following figure. In Figure 7.2, while the “RC Affix” represents the average number of relativised verb suppliance, the “Correct WO” stands for the average number of those relativised verbs that were used in the correct word order.



**Figure 7.2:** Average number of relative clause production

In the following example, P04 recognises the relativisation affix on the verb through the models provided by the researcher and is able to apply it to verb; however, the obligatory Subject-Verb inversion is not mastered yet. Thus, the processor uses the available sources for word order rule, which is the canonical word order (SOV).

(7.19) P04: *Evet. Senin resim-de \*bir adam kadın-ı sev-en var mı?*  
 Yes. Your picture-LOC a man woman-ACC  
 caress-S.REL exist Q

‘Yes. In your picture, is there a man who is caressing the woman?’

In the correct word order (Subject-Verb inversion) for relative clauses, the above relative clause that is underlined should look as follows:

(7.20) *Kadın-ı seven bir adam...*  
 woman-ACC caress-S.REL a man

‘A man who is caressing the woman...’

When heritage speakers did not apply the relativisation rule with the correct affix and word order, they made use of alternative ways to form questions which represent the procedural skill they had already acquired. These alternatives can

be seen in the following extracts from the data. In the first two examples, P04 ignores the models provided by the researcher and resorts to the basic sentence structure with canonical order of the constituents (SOV).

(7.21) P04: *Hayır. Senin resm-in-de oğlan kız-ı*  
 No. Your picture-POSS-LOC boy girl-ACC  
*döv-üyor, kız ağlı-yor var mı?*  
 beat-PRE-(3SG), girl cry-PRE-(3SG) exist Q

‘No. In your picture, a boy is beating the girl, the girl is crying. Is there such a thing?’

Again, the results support the predictions of PT. Since the participants cannot make the required exchange of grammatical information between the subordinate clause and main clause, both clauses are processed individually based on the existing procedural skills where each clause is parsed by “direct mapping of conceptual structures onto surface form, as long as there are lemmata that match the conceptually instigated searches of the lexicon” (Pienemann & Håkansson, 1999). The lack of required processing mechanisms to determine the function of the relative clause phrase to be attached to the S-node and to store this sentential information in S-holder results in the use of alternative structures, which are constrained by processability, and thus belong to lower stages.

## 7.6 Word order and Discourse Functions

Another constraint discussed in Chapter 5 is the word order and mapping of discourse functions onto the predicates of the argument. Quantitative results of the distributional analysis for word order are illustrated above in Table 7.3. The column “PT Stages” is organised according to the Unmarked Alignment Hypothesis and the Topic Hypothesis (Pienemann et al., 2005), as discussed in Chapter 5. According to these hypotheses, initially learners cannot differentiate between TOPIC and SUBJECT, and thus canonically map TOPIC to SUBJECT. The axis “(S)OV” represents this rule besides the pro-drop nature of Turkish grammar. The next axis, “ADJ+SOV” represents the introduction of an ADJUNCT to the sentence-initial position without changing the canonical order,

which results in the mapping of TOPIC to a non-argument. The axis “OSV” is for the mapping of TOPIC onto OBJECT, which requires the Object to be definite with case marking in the sentence-initial position and a non-canonical mapping procedure. However, none of the participants produced any linguistic contexts for this type of non-canonical mapping.

Although an implicational relationship can be observed between Stage 2 and Stage 3, this does not mean participants in this study cannot apply the rule Object Topicalisation which is located at Stage 4. Instead, given the type of the tasks and their specific focus, there was not any specifically designed communicative contexts in the tasks that created the linguistic context for the production of “OSV” topicalisation. Thus, the data remains partially inconclusive in terms of the development of topicalisation. The findings indicate, however, that the heritage speakers tend to map the discourse functions (e.g., Topic, Focus) to the grammatical functions (e.g., Subject, Object) in the s-structure in a linear fashion.

(7.22) P20

Task: Frog

Structure: SOV

*Cocuk kopeg-i ari-yor*

boy dog-ACC (look for)-PRE-(3SG)

“The boy is looking for the dog.”

As seen above in Table 7.4, there were also examples of ADJUNCT introduced in the sentence-initial position while the word order was kept SOV, sometimes with pro-drop of the SUBJ. This was generally

(7.23) P10

Task: Frog story

Structure: ADJ + SOV

*Simdi cocuk kopeg-i-ni bul-mak isti-yor.*

Now boy dog-POSS-ACC find-INF want-PRE-(3SG)

“Now the boy wants to find his dog.”

It must be highlighted again that none of the tasks used in the study were specifically designed for eliciting linguistic contexts for the mapping of discourse

functions, which are used optionally depending on the pragmatic requirements of the communicative context. Thus, the predictions as to whether participants have reached different developmental stages of mapping Topic function to different grammatical functions, particularly the mapping of Topic to Object, must be handled with caution. Within this line, Pienemann (2011) also points out that the developmental relationship between acquisition of discourse functions and other grammatical structures is still unclear. Further empirical evidence is required in order to provide a more reliable theoretical justification for the development of non-linear mapping of Topic, and the developmental relationship between discourse functions and grammatical structures.

Overall, the data analysed in this study sufficiently represented the developmental stages of the processability hierarchy with participants at each developmental stage. The developmental order of the targeted Turkish grammatical structures predicted in this study is also confirmed with 96 per cent scalability, which means that the stages the participants reached in the developmental hierarchy can be regarded as evidence for the procedural skills which are available to them and also constrain the variability of grammatical structures they can produce. In the next chapter, based on the robust findings, I will discuss the implications of the PT perspective on incomplete heritage language acquisition in comparison with previous accounts in the literature.

## Chapter 8. Discussion

In this study I have aimed to offer a novel theoretical model for investigating heritage language acquisition in order to reconceptualise our understanding of what is known to be incomplete in heritage language grammars. By adopting the Processability Theory (PT) framework in examining the linguistic competence of Turkish heritage speakers, I have demonstrated in previous chapters that a developmental research perspective based on cognitive universal procedural skills required for producing linguistic structures can provide theoretically reliable insights on the individual linguistic variability observed among heritage speakers. The empirical findings reveal a clear implicational relationship between the developmental stages of the targeted Turkish grammatical structures (Table 7.5), and thus the model can account for individual developmental variations at different stages along the hierarchy. Now in this chapter, as a follow-up evaluation of the research findings presented in the previous chapter, I go on to discuss these findings with a specific focus on the modelling and identification of incomplete acquisition in heritage language grammars within the existing literature addressed in Chapter 2 and within the PT framework utilised in this study.

In order to fulfil the overall aim of the study, I presented three research questions in Chapter 6, each of which was structured in such a way as to serve as a prerequisite for answering the next one. The first research question sought to answer whether the developmental sequence for a number of Turkish morphosyntactic structures (nominal and verbal inflections, pro-drop, passive, relative clause, word order and topicalisation) could be predicted by Processability Theory (Pienemann, 1998b; Pienemann et al, 2005). As shown above in Chapter 5, this was achieved by analysing these structures within LFG's linguistic formalism (Bresnan, 2001), and locating them into five developmental stages according to their processing procedures as described in the PT framework (Pienemann, 1998; Pienemann et al, 2005).

Many of the Turkish grammatical structures focused in this study have never been analysed within the PT framework before. For instance, in the nominal domain, it was shown that the genitive case marking on a noun is developmentally different from genitive-possessive marking since the former is

a lexical procedure that does not require feature unification (Stage 2) while the latter is a phrasal procedure that requires the unification of grammatical information between the two constituents of the noun phrase. It was also shown that the processing of Turkish passives, which were previously categorised into three types (personal, impersonal and middle) according to the degree of the Agent's involvement in the activity (e.g., Ketrez, 1999; Kornfilt, 1997), could be accounted for by analysing them according to the mapping relationship between a(argument)-structure and f(functional)-structure as described in the Lexical Mapping Theory (Bresnan, 2001). By using this LFG analysis and PT's Lexical Mapping Hypothesis (Pienemann et al., 2005) I hypothesised that passives could be categorised into two developmental types: those which require a linear mapping of a-structure to f-structure with no suppression of the thematic argument SUBJECT (lexical morphology, Stage 2), and those which require a non-linear mapping of a-structure to f-structure with suppression of the thematic argument SUBJECT (inter-phrasal morphology, Stage 4).

I was also able to show that the so-called free word order of Turkish was constrained by processability in that not all permutations were available all at once in one developmental stage. Instead, certain derivations from the default SOV canonical word order such as "ADJUNCT + SOV" and "O<sub>ACC</sub> SV" were licensed by the linearity of mapping relationship between discourse functions and grammatical functions as predicted in the Topic Hypothesis (Pienemann et al., 2005). Moreover, based on LFG formalism (Bresnan, 2001; Charters, 2012; Dalrymple, 2001; Falk, 2001), I demonstrated how the relationship between the head noun and relative clause in Turkish was formed by means of functional mechanisms rather than semantic and functional mechanisms as in English relative clauses. It was then predicted that relative clause was at the highest developmental stage (Stage 5) in the predicted hierarchy because forming the grammatical relationship between the noun phrase the relative clause and the head noun belonged to and the main clause required exchange of grammatical information across the clausal boundaries (Mansouri, 2005; Pienemann, 1998b).

This hypothesised hierarchy for Turkish grammatical structures was empirically tested against the data collected from 24 young heritage speakers of Turkish

living in Germany and presented in Chapter 7. As discussed earlier in Chapter 2, heritage speakers show varying degrees of competence in their linguistic abilities. Using a cross-sectional methodology enabled gathering a substantial amount of data which was believed to represent the linguistic variations for testing the developmental hierarchy across the individuals and grammatical structures. Earlier in Chapter 6, it was discussed that any hypothesis regarding the hierarchical relationship between grammatical structures in a cross-sectional study would be valid only if the implicational analysis was statistically valid too ( $C_{scal} > .60$  by Hatch & Lazaraton, 1991). Therefore, to secure the validity of the research findings, the data in this study were analysed in two steps. In the first step, a quantitative distributional analysis of linguistic contexts for grammatical rules and rule application was carried out (see tables 7 and 9 in Chapter 7). In the second step, the quantitative results were transformed into qualitative analysis by applying emergence criteria as developed by Pienemann (1998b) which was presented in an implicational table (Table 11) in Chapter 7. Statistical calculations revealed that the relationship between the hypothesised developmental stages was indeed implicational with a very high statistical value ( $C_{scal} = .96$ ).

According to this implicational hierarchy, out of the whole group of 24 Turkish heritage speakers, two of them only reached Stage 2, seventeen of them reached Stage 3, three of them reached Stage 4 and only two of them reached the highest developmental stage (Stage 5). This statistically valid implicational scale provides strong empirical evidence for the hierarchical hypotheses set for the grammatical structures analysed in this study. The reduction in the number of participants demonstrating the availability of procedural skills they acquired going up the predicted hierarchy is empirical evidence for claiming that the basic nominal and verbal morphology as well as the canonical word order are acquired first (Stage 2), which is followed by the acquisition of nominal genitive-possessive, verbal complement, and introduction of Adjunct to the sentence initial position (Stage 3). These results also support what Di Biase and Kawaguchi (2002) found for the development of morphological structures in Italian as second language. Then, the type of passive that requires non-linear mapping of a-structure to f-structure resulting in thematic suppression of the argument role (Agent) is acquired (Stage 4), which is in line with Kawaguchi's

(2005) findings of the acquisition of Japanese passives. Finally, the acquisition of relative clauses is achieved at the highest stage (Stage 5), which also confirms previous studies (for Arabic, Mansouri, 2005; for Chinese, Zhang, 2005). This implicationally valid hierarchy of processing procedures also confirms that the acquisition of procedural skills at a lower stage is a prerequisite for the acquisition of the others at the next higher stages (Pienemann, 1998b). Thus, as predicted, while a participant (i.e., P23) at developmental stage 5 produced all other structures at lower stages, a participant at stage 3 (i.e., P10) was not able to demonstrate productive and systematic use of structures at stages 4 and 5.

Given that all participants were older than 9 years, which is considered to be the end of critical period in bilingual contexts such as heritage language acquisition (Montrul, 2008), the linguistic structural choices the participants made during data elicitation tasks were considered to be based on the procedural skills available to them. For instance, not being able to map the thematic role Patient onto Subject function in passive construction and instead use an active alternative, or treating a subordinate clause and main clause as two independent clauses in a relative clause construction indicates that participants resort to their available processing mechanisms which are constrained by processability (Pienemann, 1998b, 2005). This is what the Hypothesis Space (Pienemann, 1998b) also predicts for the structural choices available to the speakers, which means that "interlanguage variation remains within predictable confines and is thus definable in a priori manner: the rule system available to the learner at his or her current level also defines the range of solutions for developmental problems which are the basis for IL variation" (Pienemann, 1998b, p.243).

With respect to my findings as evaluated here, I have been able to empirically show a robust developmental hierarchy for Turkish grammatical structures that takes into account and can measure reliably individual variation up the scale of developmental stages. Moreover, I find that from the developmental perspective adopted in this study the emergence criterion as a measurement tool has proved more useful than the other approaches used in previous studies. On this basis, the following part of this chapter will evaluate effectiveness of existing

judgements of incompleteness that I aimed to challenge in my study. It starts with a focus on input quality and quantity as the key source of incomplete acquisition, and then goes on to discuss methods of defining incompleteness.

As discussed in Chapter 2, incomplete language acquisition is a universally accepted - and mostly expected - outcome of heritage language acquisition. Studies have consistently shown how heritage speakers' linguistic competence diverges from that of monolinguals in various linguistic domains. In their review of heritage language acquisition studies, Keating et al. (2011) summarise that incomplete language acquisition occurs in early childhood whereby a child does not receive sufficient input in a language in order to (a) acquire a particular grammatical property or (b) maintain a property that was acquired but had yet to stabilise<sup>8</sup> before the onset of bilingualism or a shift in language dominance. Similarly, Montrul (2008, p.216) proposes that the difference between heritage speaker language proficiency and monolingual language proficiency is due to two factors: (1) variable amount of input; and (2) socio-affective factors, and she argues that incomplete language acquisition is likely to occur in the heritage language if heritage speakers begin to be exposed to the majority language before they acquire those linguistic phenomena which a monolingual speaker of that language normally acquires in the monolingual environment. In almost all studies that have investigated the linguistic competence of heritage speakers, it is not surprising to come across the issue of input insufficiency addressed directly or indirectly as the cause of heritage speakers' linguistic outcome, even though there is no actual empirical evidence presented regarding the input and its relation to the outcome of heritage language acquisition.

Almost all of the heritage language studies successfully employ what Ingram (1989, p.63) calls a 'theory of grammar' (or 'theory of language') in explaining the properties of the linguistic phenomena in the languages under scrutiny, which is generally within the framework of Universal Grammar (Chomsky, 1986). By doing so, language acquisition is addressed from the perspective of parameter settings in relation to input frequencies. It is thus concluded that due to lack of input, speakers of heritage languages are not able to set or reset

---

<sup>8</sup> By stabilisation, Keating et al. (2011) refer to the *complete* acquisition of a grammatical phenomenon around adolescence, which may be prone to attrition (or loss) as a result of prolonged contact with a L2.

parameters for the linguistic phenomena in their languages which eventually leads to incomplete language acquisition (Lynch, 2003; Montrul et al., 2008). However, even in some definitions of heritage language (i.e., Montrul, 2012; Polinsky, 2011), one fundamental question seems to be ignored: how much input is sufficient for a grammatical phenomenon to be acquired? In none of the heritage language studies is the type or the amount of input for this type of parameter setting specified or empirically tested within a theoretical framework, including the emergentist approach proposed by O'Grady et al. (2011). While there is a consensus on the fact that the role of input in language acquisition needs to be studied more carefully (e.g., see Piske & Young-Scholten (2009) for a review of current issues regarding the role of input in language acquisition, whose main statement is that input does matter in language acquisition), this lack of explicitness in relation to the role of input in assumptions regarding incomplete acquisition remains to be a weakness of the existing studies focusing on heritage languages.

However, in the light of a wide range of previous research on the role of input in L1 acquisition (Behrens, 2006; Ellis, 2002; Lieven, 2010; Pullum & Scholz, 2002) and in L2 acquisition (Ellis; 2003, 2006; Ellis & Collins, 2009; Long, 1996), it is reasonable, to a certain degree, to relate the linguistic outcomes of heritage language acquisition to varying quantities of input. In this vein, as I stated earlier, input on its own is not the only factor that shapes the linguistic profile of a language learner, be it in first language acquisition or in second language acquisition (Gass & Mackey, 2002). As Ellis (2002, p.178) points out, "frequency is not a sufficient explanation; otherwise we would never get beyond the definite article in our speech."

As addressed above in Chapter 2, heritage language research has also debated the qualitative change in the input in terms of exposure to a non-standard variety across generations within the primary linguistic environment (e.g. *missing-input competence divergence* approach by Pires & Rothman, 2009). Heritage speakers of Turkish living in Germany can also be assumed to have a limited exposure to quantitatively rich input and lack the meaningful context to test and use the language. However, as discussed above in Chapter 3, there is no empirical and satisfactory evidence to reach a formally structured

conclusion that Turkish heritage speakers in Germany (or in other parts of Western Europe) are exposed a type of input which is more limited or constrained in terms of linguistic richness and complexity than the monolingual variety of Turkish as spoken in Turkey. To that extent, as far as my study is concerned, it would be unreasonable to hold cross-generational linguistic variations or insufficient input conditions as responsible for linguistic variability observed among heritage language speakers of Turkish who participated in this study since two of them have been found to have acquired even the complex structures like passive and relative clause which have been considered to be prone to incomplete acquisition in previous studies. It is important here to note that as in the nature of all language acquisition studies carrying out a research study with a completely homogenous group of participants is impossible. Such is the case in my study. Although there were macro variables to make the sociolinguistic, sociocultural and socioeconomic background of the participants in this study as homogenous as possible (as explained in Chapter 6), there were some differences in their profile. For instance, for one of them (P23, see Appendix A), the fact that they arrived in Germany at the age of 5 and the fact that they seem to have achieved a higher stage in the developmental hierarchy may be connected. Similarly, the fact that P2's (see Appendix A) mother is not Turkish may have played a role in their current attainment in the developmental hierarchy. However, this is beyond the scope of this study at this point and needs careful and detailed investigation for future research.

Besides this general adherence to the impact of input insufficiency on incompleteness, the method almost invariably used in identifying incompleteness in heritage language studies is comparing the linguistic competence of heritage speakers with that of a control group (monolingual speakers) in terms of the use of a single grammatical form or a number of forms that belong to one linguistic domain (e.g., nominal, verbal). Within this methodological perspective, a general accepted binary representational approach is that a grammatical phenomenon can only be regarded as acquired if it only looks like a predetermined definition of representation elicited using certain type of methods. While doing this, the monolingual competence is taken as this predetermined norm and heritage speakers' competence is measured by accuracy rates showing at what rate they fail or achieve to use a given linguistic

structure accurately. While the data are collected through various tests and tasks such as self-assessment, cloze tests, multiple choice tests, sentence completion tasks, grammaticality judgement tasks and picture recognition/description tasks, the findings are generally interpreted by statistical analyses such as ANOVA, sample t-test, and so on (Albirini et al., 2011; Bowles, 2011; Lee-Ellis, 2011; Montrul, 2011; Montrul & Bowles, 2008; Montrul, Foote & Perpinan, 2008; O'Grady et al., 2001; O'Grady et al., 2011; Polinsky, 2011; Romanova, 2008).

For instance, Keating et al. (2011) investigated whether adult Spanish heritage speakers used the same antecedent assignment strategies as monolingual Spanish speakers did. The analysis was based on ANOVA where they examined individual response patterns to null and overt subject pronouns by tallying the proportion of participants in each group who chose the subject and object antecedents on at least 70 per cent of the trials (14/20) in each condition (null vs. overt), which was accepted to be the monolingual norm. In Keating et al.'s (2011) study, in the null pronoun condition, 74 per cent of monolingual Spanish speakers and 60 per cent of heritage speakers resolved pro in favour of the subject antecedent. In the overt pronoun condition, 21 per cent of Spanish speakers raised without English contact selected the expected object antecedent against 4 per cent of heritage speakers. The majority of heritage speakers displayed a tendency to resolve the overt pronoun in favour of the subject antecedent versus 37 per cent of monolingual Spanish speakers. In another study, Polinsky (2011) scrutinised the knowledge of subject and object relative clauses in several groups of Russian speakers, children and adults by comparing their accuracy of comprehension levels with those of monolingual groups, and found that heritage speakers at the group level demonstrated accuracy rates varying between 55 per cent and 95 per cent compared to monolinguals who achieved over 95 per cent accuracy rates. Similarly, for relative clause production another study revealed target-like accuracy rate varying between 65 per cent and 90 per cent (Lee-Ellis, 2011). In another linguistic domain, Montrul (2011) investigated morphological errors in gender, tense-aspect and mood in Spanish heritage speakers and Spanish second language learners in comparison with Spanish monolinguals, and found that the accuracy rates of heritage speakers varied between 70 per cent and 85 per

cent compared to 99 per cent of monolinguals. However, In Albirini et al. (2011), Egyptian and Palestinian heritage speakers of Arabic are reported to have native-like command of subject-verb agreement, respectively at 93 per cent and 97 per cent accuracy rates.

Although there is no so-called accuracy threshold set up by heritage language researchers to identify the success or failure in heritage language acquisition - or completeness and incompleteness in that sense, the overall assumption is that if, for a given grammatical structure, the mean accuracy rate for a particular group of heritage speakers is lower than that of the control group (the monolingual group), then the grammar of those heritage speakers is assumed to be incomplete. That is, heritage speakers' performance in various tasks and tests are measured against a predetermined target norm where only those accuracy rates that are equal to the control group's performance are regarded as an identification of the complete acquisition of a given grammatical structure. However, this assumption is not motivated by an acquisition theory and is left without providing a reliable theoretical explanation to account for the relationship between the accuracy rates and acquisition.

From the same methodological point, there are similarities between heritage language studies and Turkish language studies. For instance, Herkenrath (2012) investigated productive use of complex subordinating constructions in Turkish by Turkish-German bilinguals; however, there is no clear theoretical or linguistic account for what counts as productive or non-productive in her analysis apart from a quantitative analysis showing how many times the given grammatical structures were used in the data. In their quantity-based analysis of the differences in the use of complex embeddings in Turkish by three different groups of Turkish-German bilingual young adults (average age during recording was 20), Treffers-Daller et al. (2007) did not make it clear either how less use of given grammatical structures by participants born and raised in Germany accounted for their linguistic system's incompleteness compared to those born and raised in Turkey who used those grammatical structures more. Instead, they referred to Grosjean's (1997) complementarity principle, which implies that informants who had most contact with Turkish as spoken in Turkey chose from a variety of constructions, whereas the group in Germany and those who

returned recently had a more limited stylistic repertoire. In her analysis of the development of Turkish between Turkish-dominant and German-dominant children, Pfaff (1993) did not refer to incompleteness per se; however she employed accuracy rates of language proficiency while analysing the variation in morphosyntax between those two groups, which, as expected, demonstrated that Turkish-dominant children were more proficient than German-dominant children.

Are quantitative rates of accuracy for groups of heritage speakers compared to monolingual norms a theoretically reliable set of criterion to identify incomplete language acquisition? This methodological perspective fails to address a broad range of individual variation among heritage speakers, which can be observed even among adult monolingual speakers of the same language (see, for instance, Dąbrowska, 2012a), as well as the unique characteristics of the dynamics of interlanguage grammars observed in heritage language development. While critiquing the target language based measurements, Pienemann (1998b, p.144-153) argues that interlanguage development should not be measured by the target language contexts since grammatical structures in the interlanguage systems may occur in a different way than the target language norm, which can also be observed in the acquisition of L1. Furthermore, as a reference to individual differences, Pienemann (1998b, p. 137) also notes that “there is no guarantee that the accuracy of morpheme insertion will increase steadily in relation to any two morphemes or in relation to any two learners.” Thus, the acquisition process should be described and examined according to how learners develop within their unique linguistic system rather than what they should do according to a standard target language norm (Håkansson, 2013).

As discussed earlier, a measurement of accuracy that is based on target language norms does not sufficiently represent the process of language acquisition since the arbitrary criteria of accuracy cannot be taken as a universal point of reference for identifying the degree of language development. In this vein, the fact that monolingual grammars have some level of quantitative variations in terms of grammatical accuracy (i.e., Dąbrowska, 2012a,b) makes it even more problematic to judge heritage speakers’ linguistic incompleteness

according to an idealised but empirically unstable criterion of monolingual competence. Moreover, Pienemann (1998b, p.137) argues that accuracy-based analyses cannot capture the dynamics of acquisition process since “accuracy rates develop with highly variable gradients in relation to grammatical items and individual learners”. Previous studies have empirically shown that accuracy rates and the process of acquisition do not always correlate (Meisel et al., 1981; Pallotti, 2007; Pienemann, 1998b). For instance, Pienemann (1998b) applied emergence criterion and accuracy criterion at 50 per cent and 80 per cent to the interlanguage of a learner in six different communicative tasks and found that while application of emergence criterion produced a consistent result throughout all tasks, quantitative acquisition criteria (50 per cent and 80 per cent accuracy) produced different results. For instance, for the plural -s in English, according to 50 per cent accuracy criterion it would be acquired in four out of six tasks while it would be acquired in only two tasks if the criterion was set at 80 per cent, which illustrates that “accuracy levels do not increase steadily in the acquisition process and ... quantitative criteria are completely arbitrary” (Pienemann, 1998b, p.304).

Håkansson (2013) refers to two more recent studies on the acquisition of French while addressing the arbitrariness of the relationship between accuracy rates and acquisition. In one of them, Bartning (2002) focused on the acquisition of gender agreement on determiners by advanced and pre-advanced learners of French as L2. In the other one, Dewaele and Veronique (2001) also compared the accuracy rates for gender agreement in French. In both studies accuracy rates were compared with the hierarchy of processing procedures, and it was found that accuracy rates for gender agreement within the constituent (phrasal level) were not higher than across constituents (inter-phrasal), which as Håkansson (2013, p.118) notes, “could be expected if accuracy and development were the same.”

PT predictions do not rely on the quality or quantity of input as a variable in determining language development. Instead, as shown in this study, any misleading accuracy criteria based on predetermined target language norms are avoided by utilising linguistic emergence criterion (Pienemann, 1998b), which examines the systematic and productive use of a linguistic structure in

the interlanguage development for describing its dynamic system. According to Pallotti (2007, p.362), there are three justifications for the use of an acquisition-based emergence criterion:

...[First] by focusing on the very first uses of a new structure - rather than asking 'how much' it is supplied or 'to what extent' it is correctly used - one can identify more clearly any regular distributional patterns which may not correspond to any of the L2 rules. Secondly, emergence of a structure seems to be a more constant and less arbitrary landmark with respect to accuracy levels set anywhere between 60 and 90 per cent. Finally, emergence focuses on the order in which structures first appear, which represents a qualitative restructuring of the interlanguage.

Therefore, by operationalising acquisition-based emergence criterion, PT overcomes the methodological fallacies that might result from the arbitrary nature of accuracy-based quantitative measures and target-language oriented assumptions. While PT also makes use of a detailed quantification-based distributional analysis, it is only used as a tool to demonstrate the productive and systematic use of grammatical structures and interlanguage variability in the process of language development.

As far as I am aware, so far heritage language studies have interpreted incomplete acquisition as an outcome of the unique input conditions in the sociolinguistic environment heritage language speakers are primarily exposed to. In this research paradigm, I have argued that the identification of incomplete acquisition within the perspective of idealised target language norms and accuracy measures is rather broad and lacks theory-driven explanatory and predictive power. Therefore, by shifting the focus from an outcome-oriented approach to a process-oriented approach within the Processability Theory framework (Pienemann, 1998b; Pienemann et al., 2005), I have offered a theoretically robust and more principled way of analysing the dynamic process of language acquisition in a heritage language context in terms of cognitive procedural skills which may or may not lead to incompleteness. With the support of empirical evidence, I have demonstrated that a developmental investigation motivated by the universal language processing mechanisms can provide the field of heritage language studies with theoretical explanatory adequacy and predictive power in understanding heritage language acquisition,

rather than investigating it through the quantity-based comparisons of accuracy rates between the heritage group and the control group.

This theoretical perspective is independent of arbitrary accuracy rates, target language norms or unsupported input assumptions, and can account for individual variations within one and universal hierarchy of processing procedures as formalised in Processability Theory (Pienemann, 1998b, Pienemann et al., 2005). By using the PT framework, I have constructed a methodologically valid way of eliciting data that can be analysed and understood from the speaker's point of view, rather than from the idealised target norms. Based on the developmental analysis according to PT's linguistic emergence criterion (Pienemann, 1998b), results empirically show that there are individual variations as well as *complete* language development, which makes it even harder to generalise incompleteness as a universal phenomenon applying to a group of heritage language speakers. In arguably "insufficient" input conditions applied to heritage language contexts, even complex linguistic structures that are considered to be vulnerable can be acquired (as seen in P23 and 24), and thus incompleteness should not be taken for granted as the only universal linguistic outcome of heritage language acquisition.

## Chapter 9. Conclusion and Limitations

### 9.1 Conclusion

The overall purpose of this cross-sectional study was to investigate incomplete language acquisition by Turkish heritage speakers living in Munich, Germany from a novel developmental approach within the predictions of Processability Theory (Pienemann, 1998b, Pienemann et al., 2005). Specifically a number of morphological and syntactic grammatical phenomena, namely nominal and verbal inflections, pro-drop, passive, relative clause, word order and topicalisation, were investigated according to their procedural mechanisms within the framework of Processability Theory. The question of whether these phenomena had been acquired was answered by using distributional and implicational analyses according to emergence criterion developed by Pienemann (1998b) was applied.

To fulfil the underlying purpose of the study, the following three interconnected research questions were addressed:

- (1) How does the developmental hierarchy of various Turkish grammatical structures fit within the PT framework?
- (2) Have the young heritage speakers of Turkish in Germany reached the highest predicted stage in this hierarchy?
- (3) How can PT as a formal theory of language development contribute to the ongoing debate on incomplete first language acquisition among heritage speakers?

The study began with an overview of heritage language acquisition studies and pointed out the theoretical challenges in the literature, i.e., too much reliance on the external sociolinguistic factors that cannot be controlled or accounted for, and the lack of a theoretically reliable perspective on the identification of incompleteness based on idealised monolingual norms. Investigating the specific setting of Turkish in Germany from this perspective confirmed some similarities but also revealed differences with what has been assumed as standard about heritage language acquisition, partly because of differences

between the theoretical conceptualisation of different populations in Europe compared to the US where most the heritage language research has been done, as well as particular social and educational experiences of Turkish immigrants (as described in Chapter 3).

In order to justify the overall claim of this study, which is that the PT framework offers a theoretically reliable perspective on heritage language acquisition, I demonstrated a coherent PT-based account for the hierarchical development of Turkish grammatical structures based on the Lexical-Functional Grammar (Bresnan, 2001) analysis and processability hierarchy (Pienemann, 1998b, Pienemann et al., 2005). This analysis provided the basis for a rigorous and valid methodology for collecting data using communicative tasks with age-matched monolingual and heritage language children to maximise the examples of language production representing the participants' procedural skills.

The results empirically confirmed that the hypothesised processing procedures for Turkish grammatical phenomena were acquired in a hierarchical order predicted by Processability Theory (word/lemma > category procedure > phrasal procedure > inter-phrasal procedure > inter-clausal procedure). Therefore, the empirical findings of this study also provided further evidence for the typological and theoretical plausibility of Processability Theory, which has been previously tested for a number of languages (see Pienemann, 2005). The results also accounted for individual variations within the predicted developmental hierarchy as implied in the Hypothesis Space (Pienemann, 1998b) and revealed that based on the emergence criterion not all heritage speakers reached the highest stage of processability hierarchy. By focusing on the emergence of grammatical structures from the speaker's point of view to identify whether procedural skills have been acquired or not - rather than stating quantitative differences between the heritage language group and monolingual group, the PT perspective in this study introduced a new and theoretically more reliable tool for measuring heritage language acquisition. Previous studies exhaustively used quantity-based accuracy measures taking the monolingual norms as the criterion of mastery. The arbitrariness of accuracy measures and mastery criterion was addressed in the methodology chapter, and it was

highlighted that the emergence criterion focuses on the onset of productive use, not an end point or 100 percent mastery.

As a relatively new but very interesting field in the study of language acquisition, the field of heritage language acquisition has been focusing on explaining how the grammars of heritage languages are acquired besides accounting for how some parts of these grammars fail to be acquired. By its very nature, heritage language acquisition is a highly complex and unique process that is vulnerable to various linguistic, maturational, political and social factors. Until now, no study has provided a theoretical framework that can control the enormity of these complex, unstable and mostly individual variables. Instead, the analyses have been interpreted through accuracy rates on the group level and the findings regarding incompleteness have been easily generalised to the larger community. However, as empirically illustrated in this study, the linguistic outcome of heritage language acquisition is not necessarily as homogenous as predicted previously. Although there are individual variations, some heritage speakers in this study were found to have reached the highest developmental stage. Considering the fact that the sociolinguistic environment of Turkish heritage speakers in Germany is no more different than that of the majority of heritage speakers of other studies around the world, the findings in this study challenged previous assumptions identifying the incomplete language acquisition in relation to lack of input and inability to set/reset linguistic parameters.

On the whole, the empirical findings in this study provide robust support for the validity of PT's developmental hierarchy, and the hypotheses about feature unification, non-linear mapping and subordinate clauses as put forward. The study also provides further insights into the linguistic outcomes of heritage language acquisition from a developmental perspective and offers a promising theoretical ground for further research in the area of language acquisition by heritage speakers in different contexts. Most importantly, I argue that moving away from unjustifiable assumptions of interpreting incompleteness as an outcome and instead focusing on language acquisition as a developmental process, as explained within PT, provides a theoretical framework that has universal applicability and predictive power for investigating heritage language

grammars. With further empirical investigation, this new theoretical perspective is believed to shed more light on our understanding of heritage language acquisition.

## 9.2 Limitations

There are several constraints which make this study *incomplete* and are expected to be addressed in future studies.

The first limitation is due to the amount of linguistic phenomena that were empirically tested in the study. Only certain number were analysed within the PT framework and tested with heritage speakers. The findings support the validity of the developmental sequence of Turkish predicted in PT; however, there are various grammatical phenomena that need to be addressed, such as different types of questions, causatives, other types of subordinate clauses (noun clauses, adverbial clauses). More specifically the hierarchical order of case morphology and tense/aspectual morphology as well as the word order and information structure requires further investigation.

In connection with the need for analysing more grammatical phenomena, there is also a need for more specifically-designed data elicitation tasks. By its nature, PT is mainly interested in online language production. Since many of those phenomena may not be easily observed in the naturalistic data, future research needs to take into consideration the quality of the data that will be relevant enough to answer the research questions. Along with the phenomena and tasks, more empirical studies need to be carried out with Turkish heritage speakers in other bilingual communities, with people who learn Turkish as a second or foreign language, and with monolinguals. Besides cross-sectional studies, longitudinal studies should also be conducted to shed further light on the developmental hierarchy of Turkish grammatical structures.

On a more personal level, as I mentioned in the Introduction, my main motivation to take up this study was that I was interested in how my Germany-based immigrant relatives were operating in languages they used, namely Turkish and German. I originally envisaged this study as some sort of a parallel examination of Turkish as heritage language and German as second language as to whether any of these two languages had indeed been acquired

incompletely or not. In order to do that, I collected two sets of data using the same methodology: one in Turkish, which I carried out myself; and one in German which two German colleagues of mine helped collecting. However, as the research progressed, this turned out to be potential problem making scope of my thesis too broad. Therefore, in order to keep the focus clearer and the research study feasible, I reconceptualised my research questions to concentrate on Turkish language only, particularly once I realised that hypothesising a developmental hierarchy for Turkish grammatical structures would be a novel theoretical description as a contribution to the development of Processability Theory. Had I initially started this research project with a focus on the acquisition of Turkish as a heritage language only, then the data collection could have been expanded to cover a much wider area of Turkish grammar such as modals, questions, adverbial clauses, noun clauses and conjoined clauses. Due to lack of time, I was not able to restructure the tasks or expand the data collection; however, the key aim of the study to account for the developmental hierarchy of Turkish grammatical structures within PT and test predictions of incompleteness within heritage language acquisition from a developmental perspective has, as I empirically argued, been successfully met.

## Chapter 10. Appendices

### A. Participant information

Code	Sex	Birth Date	Age at data collection	Birth Place	Kindergarden (German)	Formal edu. in Turkish	Notes
P01	M	1998	13	Germany	Yes (age 3)	No	Mother is Turkish. Father is not Turkish.
P02	F	2000	11	Germany	Yes (age 3)	No	Mother is German monolingual. Father is Turkish.
P03	M	2000	11	Germany	Yes (age 4)	No	Both parents are Turkish.
P04	F	2000	11	Germany	Yes (age 3)	No	Both parents are Turkish.
P05	F	1997	14	Germany	Yes (age 3)	No	Both parents are Turkish.
P06	F	1997	14	Germany	Yes (age 4)	No	Both parents are Turkish.
P07	F	1997	14	Germany	Yes (age 3)	No	Both parents are Turkish.
P08	M	1999	12	Germany	Yes (age 3)	No	Both parents are Turkish.
P09	M	1998	13	Germany	Yes (age 3)	No	Both parents are Turkish.
P10	F	1997	14	Germany	Yes (age 4)	No	Both parents are Turkish.
P11	M	1997	14	Germany	Yes (age 3)	Yes	Both parents are Turkish.
P12	M	1999	12	Germany	Yes (age 4)	No	Both parents are Turkish.
P13	F	2000	11	Germany	Yes (age 3)	No	Both parents are Turkish.
P14	F	1999	12	Germany	Yes (age 3)	No	Both parents are Turkish.
P15	F	1998	13	Germany	Yes (age 3)	No	Both parents are Turkish.
P16	M	1998	13	Germany	Yes (age 3)	No	Both parents are Turkish.
P17	F	1997	14	Germany	Yes (age 3)	No	Both parents are Turkish.
P18	M	2000	11	Turkey	Yes (age 5)	No	Participant moved to Germany at age 5. Both parents are Turkish.
P19	F	2001	10	Germany	Yes (age 3)	No	Both parents are Turkish.
P20	M	1995	16	Germany	Yes (age 3)	No	Both parents are Turkish.
P21	M	1999	12	Germany	Yes (age 3)	No	Both parents are Turkish.
P22	F	1996	15	Germany	Yes (age 5)	No	Both parents are Turkish.
P23	F	2000	11	Turkey	Yes (age 5)	No	Participant moved to Germany at age 5. Both parents are Turkish.
P24	F	1998	13	Germany	Yes (age 3)	No	Both parents are Turkish.

## B. Consent Letter

NEWCASTLE UNİVERSİTESİ  
Eğitim, İletişim ve Dil Bilimleri Bölümü  
NEWCASTLE - İNGİLTERE

Sayın Veliler, Sevgili Anne-Babalar

Şu anda İngiltere-Newcastle Üniversitesi'nde eğitim ve dil bilimi alanında doktora programında okumaktayım. Programın bir gereği olarak, bir araştırma planladım. Bu çalışmada Almanya'da doğmuş olan 8-14 yaş arasındaki Türk kökenli çocukların dil gelişimleri incelenecektir. Araştırma Almanya-Paderborn Üniversitesi'nden Prof. Manfred Pienemann ve İngiltere-Newcastle Üniversitesi'nden Dr. Clare Wright tarafından desteklenmektedir.

Araştırmanın temel amacı bu çocuklarda Türkçe'nin anadil olarak gelişmesini etkileyen faktörleri ortaya çıkarmaktır. Bu amacı gerçekleştirebilmek için sizin ekteki anketi doldurmanıza, çocuklarınızın da birkaç tane konuşma aktivitesine katılmalarına ihtiyaç duymaktayız.

Katılmasına izin verdiğiniz takdirde, çocuğunuz konuşma aktivitelerine okulda katılacaktır. Size zarf içerisinde gönderilen anketleri sizin ve eşinizin ayrı ayrı doldurması gerekmektedir. Çocuğunuzun katılacağı aktivitelerin onun fiziksel ve psikolojik sağlığına veya okuldaki derslerine olumsuz bir etkisi olmayacağından emin olabilirsiniz. Sizden ve çocuğunuzdan elde edilen her türlü bilgi kesinlikle gizli tutulacak ve bu bilgiler sadece bilimsel araştırma amacıyla kullanılacaktır. Bu formu imzaladıktan sonra hem siz hem de çocuğunuz araştırmadan ayrılmaya hakkına sahipsiniz. Araştırma sonuçlarının özeti tarafımızdan okula ulaştırılacaktır.

Araştırma sonucunda elde edilen bilgiler, çocukların anadil olarak hem Türkçe'yi hem de Almanca'yı öğrenmelerini etkileyen faktörlerin saptanmasına ve eğitim politikalarının daha iyi düzenlenmesine çok önemli katkılarda bulunacaktır. Araştırmayla ilgili sorunlarınızı ve görüşlerinizi aşağıdaki e-posta adresini veya telefon numaralarını kullanarak bize ulaştırabilirsiniz.

Bu çalışmaya göstermiş olduğunuz ilgi için çok teşekkür ederiz.

Saygılarımızla,  
Fatih Bayram  
King George VI Building  
School of Education, Communication and Language Sciences  
Newcastle University, UK  
Tel: +447594064703 // +498954639239 (08/06/2011 tarihine kadar)  
E-posta: [fatih.bayram@ncl.ac.uk](mailto:fatih.bayram@ncl.ac.uk)

*Lütfen bu çalışmaya katılmak konusundaki tercihinizi aşağıdaki seçeneklerden size en uygun gelenin altına imzanızı atarak belirtiniz ve bu formu en kısa zamanda çocuğunuzla okula geri gönderiniz.*

**A)** Bu çalışmaya tamamen gönüllü olarak katılıyorum ve çocuğum .....'nın da katılımcı olmasına izin veriyorum. Çalışmayı istediğim zaman yarıda kesip bırakabileceğimi biliyorum ve verdiğim bilgilerin bilimsel amaçlı olarak kullanılmasını kabul ediyorum.

Baba Adı-Soyadı..... Anne Adı-Soyadı.....

İmza ..... İmza .....

**B)** Bu çalışmaya katılmayı kabul etmiyorum ve çocuğumun .....'nın da katılımcı olmasına izin vermiyorum.

Baba Adı-Soyadı..... Anne Adı-Soyadı.....

İmza ..... İmza .....

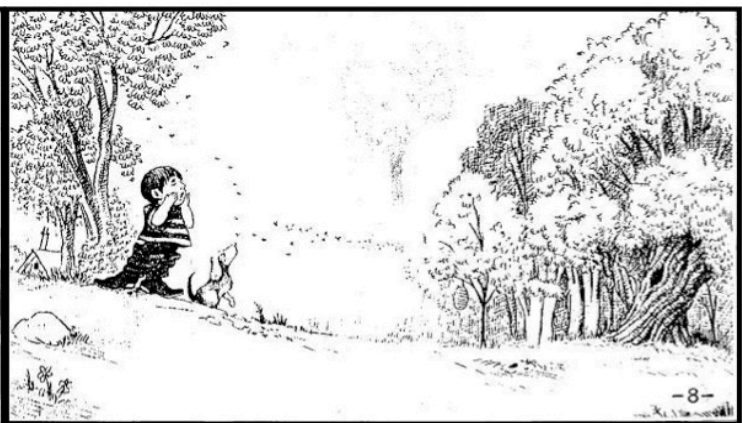
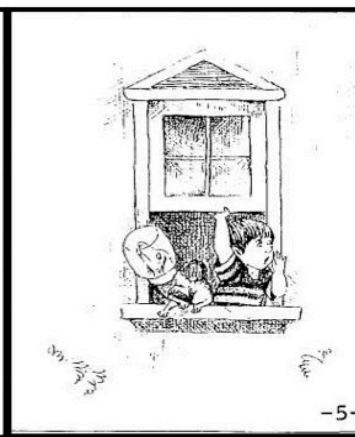
### **C. Pre-task interview guiding questions**

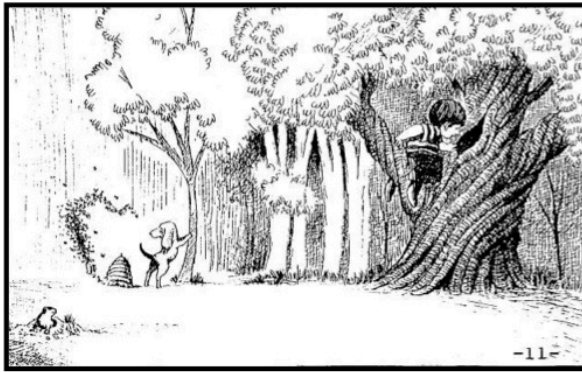
- Name
- School grade
- Date/place of birth
- Parents
  - occupation
  - Place of birth
  - Languages they can speak
- Siblings
- Visit to Turkey
  - How often
  - How long
  - The last time
  - Things done in Turkey
- Kindergarten
- Languages spoken within the home environment and with friends outside home
- Language preference for reading, listening to music, watching tv etc
- Education in Turkish
- Hobbies, future plans

## D. Transcription Conventions

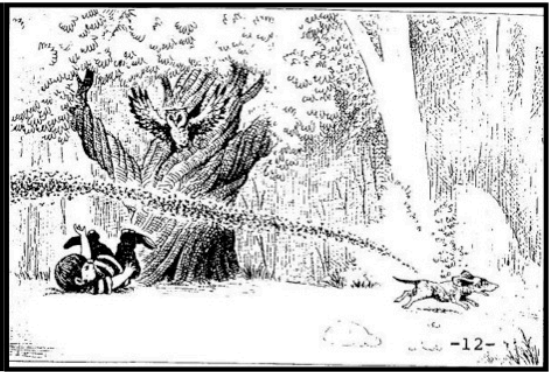
Symbol	Meaning
(/)	within a text: interruption
(/)	at the end of a sentence: incomplete sentence
(xxx)	incomprehensible utterance
(...)	utterance to be continued
(??)	uncertain, unclear
(#)	short pause
(##)	pause
(###)	long pause
{text}	comments in language other than target language
(text)	explaining remarks
[text]	two or more speakers talk simultaneously
(um)	fillers
(*w*)	far from target language standard

### E. Frog Story Pictures





-11-



-12-



-13-



-14-



-15-



-16-



-17-



-18-



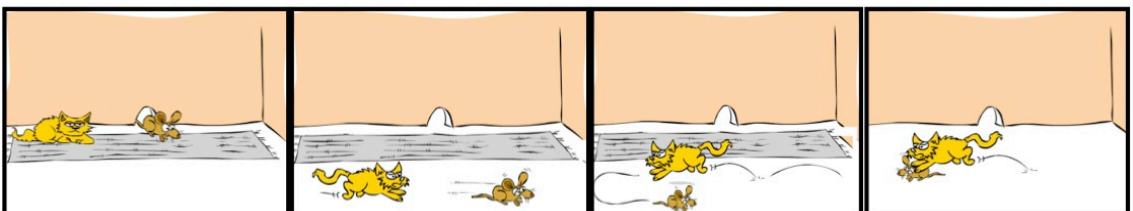
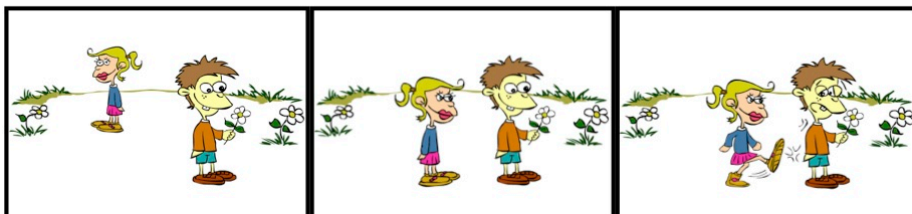
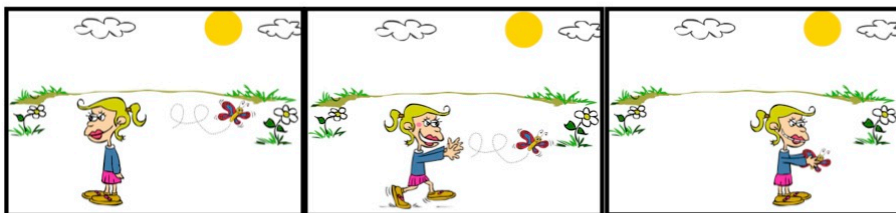
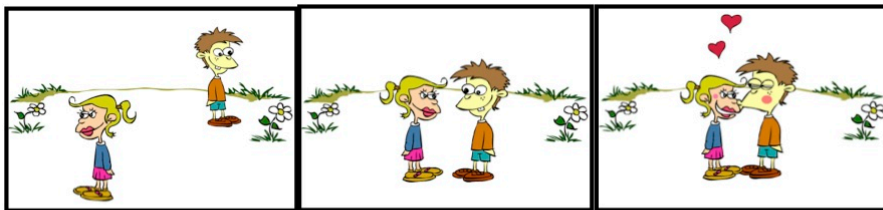
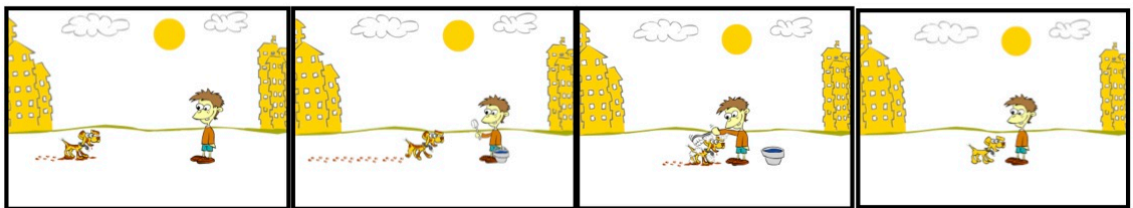
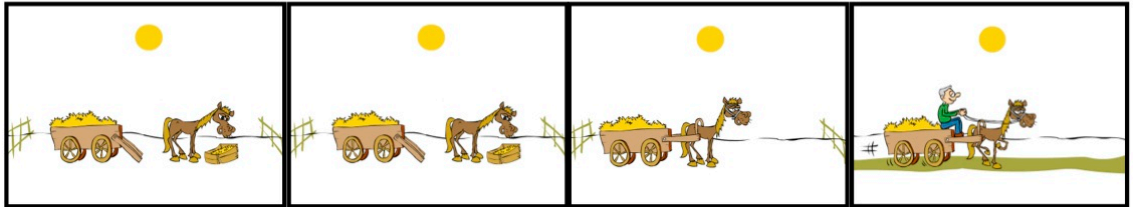
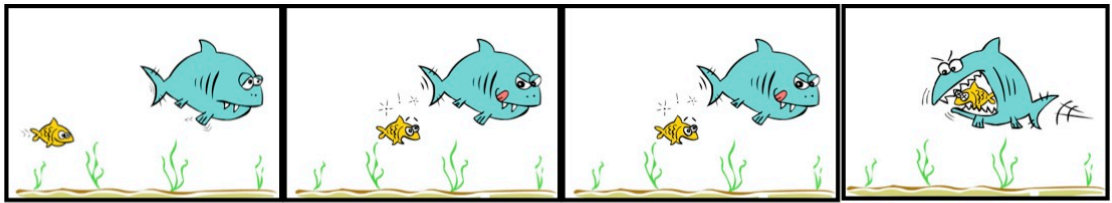
-19-

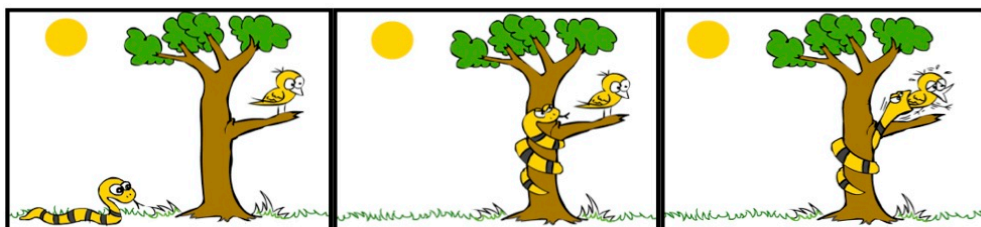
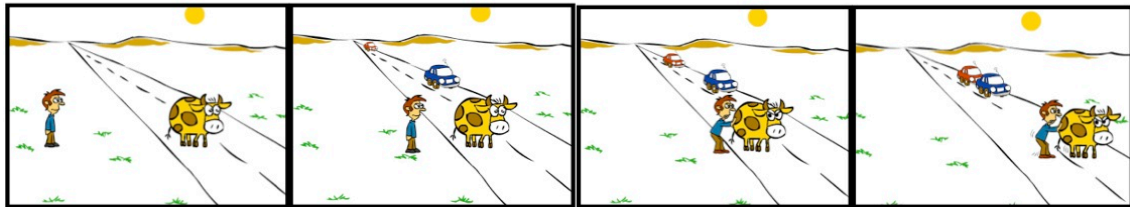
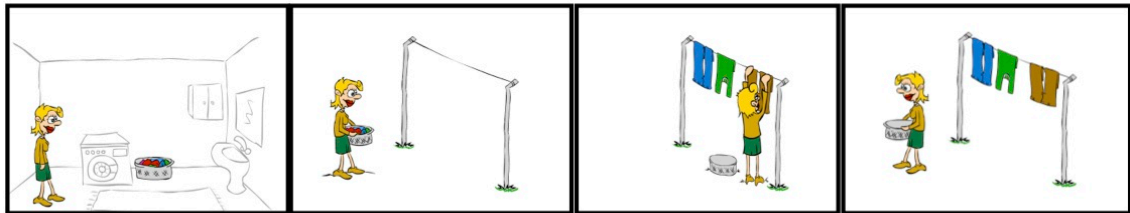
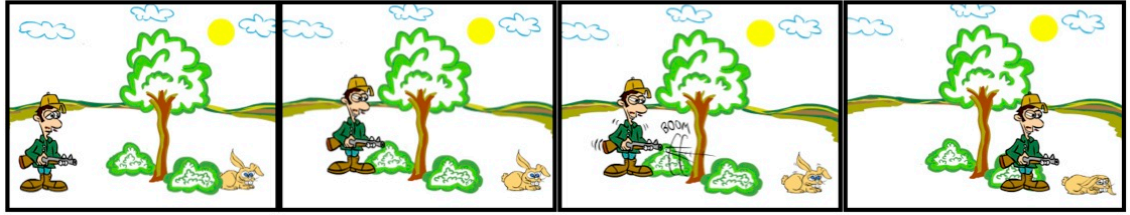
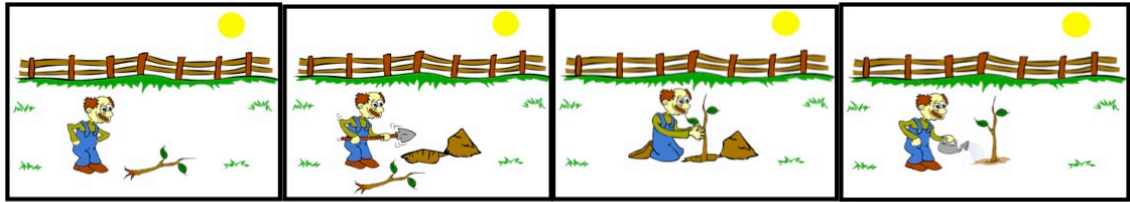


-20-



## F. Passive Elicitation Task Pictures









## G. Transcriptions (CD)

## References

- Aarssen, J. (1996). *Relating Events in Two Languages: Acquisition of Cohesive Devices by Turkish-Dutch Bilingual Children at School Age* (Studies in Multilingualism 2). Tilburg, The Netherlands: Tilburg University Press.
- Abadan-Unat, N. (1985). Identity crisis of Turkish migrants, first and second generation. In I. Baqgöz and N. Furniss (eds.), *Indiana University Turkish Studies. Volume 5: Turkish Workers in Europe. An Interdisciplinary Study*, pp. 3–22. Bloomington: Indiana University.
- Akinci, M.-A., Jisa, H., and Kern, S. (2001). Influence of L1 Turkish on L2 French narratives. In L. Verhoeven and S. Strömqvist (eds.), *Narrative Development in a Multilingual Context*, pp. 189–208). Amsterdam: John Benjamins.
- Aksu-Koç, A. (1988). *The Acquisition of Aspect and Modality: The Case of Past Reference in Turkish*. Cambridge, UK: Cambridge University Press.
- Aksu-Koç, A. (1994). Development of linguistic forms: Turkish. In R. A. Berman and D. I. Slobin (eds.), *Relating Events in Narrative: A Crosslinguistic Developmental Study*, pp. 329–85. Hillsdale, NJ: Lawrence Erlbaum.
- Aksu-Koç, A. (2010). The course of normal language development in Turkish. In S. Topbas and M. Yavas. (eds.), *Communication Development and Disorders*. Bristol: Multilingual Matters, pp. 65-103
- Albirini, A., Benmamoun, E. & Saadah, E. (2011). “Grammatical features of Egyptian and Palestinian Arabic heritage speakers’ oral production”. *Studies in Second Language Acquisition* 33: 273-304.
- Aksu-Koç, A. & Slobin, D. I. (1985) The Acquisition of Turkish, In Slobin, D. I. (Ed). *The Crosslinguistic Study of Language Acquisition*. Volume 1: The Data. New Jersey: Lawrence Erlbaum Associates, Publishers. 839-878.
- Auernheimer, G.(2006). The German education system: dysfunctional for an immigration society. *European Education*, 37(4), 75-89.

- Backus, A. (2004) Turkish as an immigrant language in Europe. In T.K. Bhatia and W.C. Ritchie (eds) *The Handbook of Bilingualism* (pp. 689-724). Oxford: Blackwell.
- Baker, C. L., & McCarthy, J. J. (Eds.). (1981). *The logical problem of language acquisition*. Cambridge: MIT Press.
- Bamberg, M. (1987). The acquisition of narratives. Berlin: Mouton de Gruyter
- Bartning, I. (2002). Gender agreement in L2 French: Pre-advanced vs advanced learners. *Studia linguistica*, 54(2), 225-237.
- Batman-Ratyosyan, N. & Stromswold, K. (1999). What Turkish acquisition tells us about underlying word order and scrambling. *Proceedings of the 23th Annual University of Pennsylvania Linguistics Conference*. 6 (1), 37-52.
- Bayraktarotlu, A. (1999). Non-standard uses in the mother tongue by the Turkish diaspora adolescents in England. In Bayraktarotlu, A. (ed.), *TASG News. Newsletter of the Turkish Area Study Group*, 49 (special edition: *Turkish Language in Diaspora*), 28–39.
- Bayram, F. (2009) Structural Priming and Development of Redundant Structures. Unpublished MA dissertation, The University of Newcastle upon Tyne, UK.
- Beck, E. (1999). "Language Rights and Turkish Children in Germany." *Patterns of Prejudice* 33(2), pp. 3-12.
- Behrens, H. (2006). The input–output relationship in first language acquisition. *Language and Cognitive Processes*, 21(1-3), 2-24.
- Benmamoun, E., Albirini, A., Saadah, E., & Montrul, S. (2008). *Agreement and plural features in heritage Arabic speakers*. Paper presented at the Second Heritage Language Summer Institute, Harvard University, Cambridge, MA.
- Benmamoun, E., Montrul, S., Polinsky, M. (2010) White paper: Prolegomena to heritage linguistics. *Harvard University*. On [http://scholar.harvard.edu/files/hl\\_white\\_paper\\_june\\_12\\_0.pdf](http://scholar.harvard.edu/files/hl_white_paper_june_12_0.pdf) Accessed on 15.10.2012

- Berman, R. A. (2000). "Children's innovative verbs versus nouns: Structured elicitations and spontaneous coinages." In L. Menn & N. Bernstein-Ratner (eds), *Methods for Studying Language Production*, pp. 69-93. Hillsdale NJ: Lawrence Erlbaum
- Berman, R. A., & Slobin, D. I. (1994). *Relating events in narrative: A cross-linguistic developmental study*. Hillsdale, NJ: Erlbaum.
- Blix, H. (2011). Complex Nuclei in Turkish Relative Clauses: Incorporation as an Obligatory Voice Construction, *IGDAL, University of Leipzig, Germany*
- Bock, K. and Griffin, Z. M. (2000) 'The persistence of structural priming: Transient activation or implicit learning?', *Journal of Experimental Psychology-General*, 129(2), pp. 177-192.
- Bolger, P. A., & Zapata, G. C. (2011). Psycholinguistic approaches to language processing in heritage speakers. *Heritage Language Journal*, 8(1), 1-29.
- Bowerman, M. (1985). What shapes children's grammars? In D. I. Slobin (ed.), *The crosslinguistic study of language acquisition*. Vol. 2. *Theoretical issues*. Hillsdale NJ: Erlbaum
- Bowles, M. (2011). Exploring the role of modality: L2-heritage learner interactions in the Spanish language classroom. *Heritage Language Journal*, 8(1), 30-65.
- Bresnan, J. (2001): *Lexical-functional syntax*. Malden: Blackwell.
- Bresnan, J. & Kanerva, J. M. (1989). Locative inversion in Chichewa: A case study of factorization in grammar. *Linguistic Inquiry*, 20(1), 1–50.
- Brown, R. (1973). *A first language: The early stages*. Cambridge, Mass.: Harvard University Press.
- Bylund, E., & Díaz, M. (2012). The effects of heritage language instruction on first language proficiency: a psycholinguistic perspective. *International Journal of Bilingual Education and Bilingualism*, 15(5), 593-609.

- Cabo, D. P. Y., & Rothman, J. (2012). The (Il) Logical Problem of Heritage Speaker Bilingualism and Incomplete Acquisition. *Applied Linguistics*.
- Çagri, I. M. (2005) Minimality and Turkish relative clauses. Unpublished PhD Thesis, University of Maryland College Park.
- Carreira, M. (2004). Seeking explanatory adequacy: A dual approach to understanding the term “heritage language learner.”. *Heritage Language Journal*, 2(1), 1-25.
- Castles, S. (1980) The social time-bomb: education of an underclass in West Germany. *Race and Class*, 21 (4), pp. 369-387
- Castles, S. (2004). 'Migration, citizenship and education' 17-48 in Banks, J.A. (ed.) *Diversity and Citizenship Education: Global Perspectives*. San Francisco: Jossey-Bass/Wiley.'
- Cazzoli-Goeta, M. and Young-Scholten, M. (2011). Expanding choice or syntactic attrition? In K. Potowski and J. Rothman (eds.) *Bilingual Youth. Spanish in English-speaking Countries*. Amsterdam: Benjamins. pp. 201-226.
- Cazzoli-Goeta, M., Guijarro-Fuentes, P. and Young-Scholten, M. (2010). Beyond Attrition: What we need to Consider in the Study of New Spanish Varieties. Investigating UK Spanish variety: Implications for heritage speaker acquisition. In P. Guijarro-Fuentes and L. Domínguez (eds.) *New Directions in Language Acquisition. Romance Languages in the Generative Perspective*. Cambridge: Cambridge Scholars. Pp. 453-478.
- Çetinoglu, Ö. (2009). Building a lexical functional grammar for Turkish. Unpublished PhD Thesis. Sabanci University, Turkey
- Çetinoglu, Ö. And Oflazer, K. (2006). Morphology-syntax interface for Turkish LFG. *Proceedings of the 21st International Conference on Computational Linguistics and 44th Annual Meeting of the ACL*, Sydney, p. 153–160
- Charters, H. (2012). Agreement and pro-drop. Lexical-Functional Grammar lecture notes, University of Auckland, New Zealand

- Chaudron, C. (2003) 'Data collection in SLA research', in Doughty, C. and Long, M. H. (eds) *The Handbook of Second Language Acquisition*. Malden, MA: Blackwell Pub., pp. 762-831.
- Chomsky N., (1972), "Deep Structure, Surface Structure and Semantic Representation", in Chomsky, *Studies on Semantics in Generative Grammar*, Mouton.
- Chomsky, N. (1980). *Rules and Representations*. New York: Columbia University Press.
- Chomsky, N. (1986). *Knowledge of language: its nature, origin and use*. Praeger, New York.
- Clahsen, H. (1990). The comparative study of first and second language development. *Studies in Second Language Acquisition*, 12, 135–153.
- Clahsen, H. & Muysken, P. (1986). The availability of universal grammar to adult and child learners: A study of the acquisition of German word order. *Second Language Research*, 5, 93–119.
- Dąbrowska, E. (2012a) "Different speakers, different grammars: Individual differences in native language attainment". *Linguistic Approaches to Bilingualism 2*: 219-253
- Dąbrowska, E. (2012b) "Explaining individual differences in linguistic proficiency" *Linguistic Approaches to Bilingualism 2*: 324-335 (response to peer commentary).
- Dalrymple, M. (2001). *Syntax and Semantics. Lexical functional grammar*. Vol. 34. San Diego, CA: Academic Press.
- Davies, A. (2003). *The native speaker. Myth and reality*. Clevedon, UK: Multilingual Matters.
- DeCamp, D. (1973). Implicational scales and sociolinguistic linearity. *Linguistics*, 73, 30-43.
- Demircan, O., (1996a). *Turkçenin Sездizimi*. Der Yayınevi, Istanbul.

- Demircan, O., (1996b). The rules of inversion in Turkish. In: Bengisu, Rona (Ed.), *Current Issues in Turkish Linguistics, Proceedings of the Fifth International Conference on Turkish Linguistics, Vol. 1*. Ankara, Hitit Yayınevi, pp. 33–47.
- Destatis. "Erstmals mehr als 16 Millionen Menschen mit Migrationshintergrund in Deutschland." Pressemitteilung Nr. 248 (14.07.2010). <[http://www.destatis.de/jetspeed/portal/cmsSites/destatis/Internet/DE/Presse/pm/2010/07/PD10\\_\\_248\\_\\_122,templateId=renderPrint.Psm](http://www.destatis.de/jetspeed/portal/cmsSites/destatis/Internet/DE/Presse/pm/2010/07/PD10__248__122,templateId=renderPrint.Psm)>
- Dewaele, J. M., & Véronique, D. (2001). Gender assignment and gender agreement in advanced French interlanguage: A cross-sectional study. *Bilingualism: Language and Cognition*, 4(3), 275-297.
- Di Biase, B. (2007). *A Processability Approach to the Acquisition of Italian as a Second Language: Theory and Applications*. PhD Thesis, Australian national University
- Di Biase, B., & Kawaguchi, S. (2002): "Exploring the typological plausibility of processability theory: Language development in Italian second language and Japanese second language." *Second Language Research*, 18 (3), pp. 274-302.
- Doughty, C. (1991). Second language instruction does make a difference: Evidence from an empirical study of SL relativisation. *Studies in Second Language Acquisition*, 13 (4), pp. 431-469.
- Dörnyei, Z. & Shekan, P. (2008). Individual differences in second language learning. In In C. Doughty & M. Long (Eds.), *The handbook of second language acquisition*. Malden, MA: Blackwell.
- Dulay, H. & Burt, M. (1974). Natural sequences in child second language acquisition. *Language Learning*, 24, 37-53.
- Ekmekci, Ö. (1979) *Acquisition of Turkish: A Longitudinal Study on the Early Language Development of a Turkish Child*. Unpublished doctoral dissertation, The University of Texas at Austin.

- Eckman, F. R., Bell, L., & Nelson, D. (1988). On the generalisation of relative clause instruction in the acquisition of English as a second Language. *Applied Linguistics*, 9, pp.1-20.
- Ekmekçi, Ö. (1982) Acquisition of Verbal Inflections in Turkish *Journal of Human Science* 2, 227-241.
- Enc, M., 1991. The semantics of specificity. *Linguistic Inquiry*, 2–1, 1–26.
- Ellis, N. (2002). Frequency effects in language processing. *Studies in second language acquisition*, 24(2), 143-188.
- Ellis, N. (2003): “Constructions, chunking, and connectionism: the emergence of second language structure.” In *The handbook of second language acquisition* edited by C. Doughty & M. Long. Oxford: Blackwell Publishing: pp. 63-103.
- Ellis, N. (2006). Selective attention and transfer phenomena in L2 acquisition: Contingency, cue competition, salience, interference, overshadowing, blocking, and perceptual learning. *Applied Linguistics*, 27, pp. 164-94.
- Ellis, N., & Collins, L. (2009). Input and second language acquisition: The roles of frequency, form, and function introduction to the special issue. *The Modern Language Journal*, 93(3), pp. 329-335.
- Ellis, R. (2000). *The study of second language acquisition*. Oxford University Press, USA.
- Ellis, E., Gogolin, I., & Clyne, M. (2010) The Janus face of monolingualism: a comparison of German and Australian language education policies. *Current Issues in Language Planning*, 11 (4), pp.439-460
- Erguvanlı, E., (1984). *The Function of Word Order in Turkish Grammar*. University of California Press, Berkeley.
- Erku, F., (1983). *Discourse Pragmatics and Word Order in Turkish*. Unpublished PhD Dissertation, University of Minnesota.

- Eryilmaz, A. (2002). 40 years in Germany - At home abroad DOMIT (Documentation Centre and Museum of the Migration from Turkey).
- Faas, D. (2008). From foreigner pedagogy to intercultural education: an analysis of the German responses to diversity and its impact on schools and students. *European Educational Research Journal*, 7(1): 108-123.
- Fabri, R. (2008): "Lexical Functional Grammar", in: Jörg-U. Keßler (ed.), *Processability Approaches to Second Language Development and Second Language Learning*, Newcastle: Cambridge Scholars Publishing, 31-66.
- Falk, Y. N. (2001), *Lexical-Functional Grammar: An Introduction to Parallel Constraint-Based Syntax*, Stanford, Calif.: CSLI Publications
- Felix, S. W. (1984). Maturational aspects of universal grammar. In A. Davies, C. Cripser, & A. Howatt (Eds.), *Interlanguage*. Edinburgh: Edinburgh University Press.
- Fishman, J. (2001). *Can threatened languages be saved? Reversing language shift, revisited: A 21st century perspective*. Clevedon, England: Multilingual Matters.
- Fishman, J. (2006). Acquisition, maintenance and recovery of heritage languages. In G. Valdés, J. Fishman, R. Chavez, & W. Perez (Eds.), *Developing minority language resources: The case of Spanish in California* (pp. 12–22). Clevedon, UK: Multilingual Matters.
- Gaebel, M. K. (2011). The Failed Project of Multiculturalism: The Case of Turkish Immigrants. *The Journal*, 1.
- Gardner, R.C., Lambert, W.E. (1982) *Attitudes and motivation in second language learning*. Newbury House Publishers
- Gass, S. (1979). Language transfer and universal grammatical relations. *Language Learning*, 29, pp. 327-344.
- Gass, S. M. and Mackey, A. (2000) *Stimulated recall methodology in second language research*. Mahwah, NJ: L. Erlbaum Associates.

- Gass, S. M., & Mackey, A. (2002). Frequency effects and second language acquisition. *Studies in Second Language Acquisition*, 24(02), 249-260.
- Gass, S. M., & Mackey A. (2007). Data elicitation for second and foreign language research. Mahwah, NJ: Lawrence Erlbaum Associates.
- Göçmen, E., Sehitoglu, O., and Bozsahin, C. (1995). An outline of Turkish syntax. Technical Report 95–2, METU Department of Computer Engineering, Ankara, Turkey
- Göksel, A. (1993). Levels of Representation and Argument Structure in Turkish. Ph.D. Thesis, SOAS, University of London, London.
- Göksel, A. & Kerslake, C. (2005). *Turkish: A Comprehensive Grammar*. London: Routledge.
- Göksel, A., & Özsoy, S., (1998). Is there a focus position in Turkish? Paper presented at the IXth international conference on Turkish linguistics. Oxford University.
- Gogolin, I. (2005). Bilingual education - the German experience and debate. In: Söhn, J. (ed.), *The Effectiveness of Bilingual School Programs for Immigrant Children*, pp. 133-146
- Greenberg, J.H. (2000). Some Universals of Grammar with Particular Reference to the Order of Meaningful Elements, *In: Joseph H. Greenberg (ed.). Universals of Language*. London: MIT Press, pp. 76-80.
- Grosjean, F. (1997). The bilingual individual. *Interpreting*, 2(1-2), 1-2.
- Grosjean, F. (1998) Studying bilinguals: Methodological and conceptual issues. *Bilingualism: Language and Cognition* 1 (2), 131-149. Also in T.K. Bhatia and W.C. Ritchie (eds) *The Handbook of Bilingualism* 2004 (pp. 32-63). Oxford, England: Blackwell Publishing.
- Guttman, L. (1944). A basis for scaling qualitative data. *American Sociological Review*, 9, 139-150.

- Güngördü, Z. and Oflazer, K. (1995). Parsing Turkish using the lexical functional grammar formalism. *Machine Translation*. 10(4), pp.293-319
- Hackett, S. (2011) *A Learning Curve: The Education of Immigrants in Newcastle-upon-Tyne and Bremen from the 1960s to the 1980s*. In: International Handbook of Migration, Minorities and Education: Understanding Cultural and Social Differences in Processes of Learning. Springer, pp. 349-364.
- Haig, G. and Braun, F. (1999). The state of the Turkish language in Germany. Newsletter of the Turkish Area Study Group. Special edition: Turkish Language in the diaspora, (49), pp. 13-18.
- Håkansson, G. (2001). Tense morphology and verb-second in Swedish L1 children, L2 children and children with SLI. *Bilingualism: Language and cognition*, 4(01), 85-99.
- Håkansson, G. (2013). Processability Theory Explaining developmental sequences. In María del Pilar García Mayo, Mara Junkal Gutierrez Mangado, Mara Martinez Adrin (Eds). *Contemporary Approaches to Second Language Acquisition*, 111. Amsterdam: John Benjamins
- Håkansson, G., Pienemann, M., & Sayehli, S. (2002). Transfer and typological proximity in the context of L2 processing. *Second Language Research*, 18, 250–273.
- Harley, B. and Wang. W. (1997). The Critical Period Hypothesis: where are we now? In A. de Groot and J. Kroll (eds.) *Tutorials in bilingualism: psycholinguistic perspectives*. Mahwah, NJ: Lawrence Erlbaum. 19-52.
- Hatch, E. & Lazaraton, A. (1991). *The research manual: Design and statistics for applied linguistics*. New York: Newbury House.
- Haznedar, B. (2003). Missing surface inflection in adult and child L2 acquisition. In *Proceedings of the 6th Generative Approaches to Second Language Acquisition Conference (GASLA 2002)*, ed. Juana M. Liceras et al (pp. 140-149).

- He, A.W. (2010). The heart of heritage: sociocultural dimensions of heritage language learning. *Annual Review of Applied Linguistics*, (30) 66-82
- Herkenrath, A., KaraKoç, B., and Rehbein, J. (2003). Interrogative elements as subordinators in Turkish: Aspect of Turkish-German bilingual children's language use. In Müller, N. (Ed) *Vulnerable Domains in Multilingualism*. pp. 221-270 Amsterdam: John Benjamins
- Herkenrath, A. (2012). Receptive multilingualism in an immigrant constellation: Examples from Turkish-German children's language. *International Journal of Bilingualism*, 16 (3), pp. 287-314
- Hoff, E. (2009). *Language development*. Wadsworth Publishing Company.
- Hoff, G.R. (1995) Multicultural Education in Germany: historical development and current status, in Banks, J.A. (Ed.) *Handbook of Research on Multicultural Education*. New York: Macmillan.
- Hoff, H. (2011) 'Fifty Years After the Invite, Turks Are Still Outsiders in Germany', *Time*, 3 November, last viewed 15 October 2012, <http://www.time.com/time/world/article/0,8599,2098464,00.html>
- Hoffman, B., (1995). The Computational Analysis of the Syntax and Interpretation of "Free" Word Order in Turkish. Unpublished PhD dissertation, University of Pennsylvania.
- Hottmann, L. (2008). Turkish language provision in Berlin. Unpublished MA dissertation, University of Manchester, UK
- Hulsen, M. (2000). *Language loss and language processing. Three generations of Dutch migrants in New Zealand*. Ph.D. dissertation, University of Nijmegen, The Netherlands.
- İşsever, S., (2000). Turkcede Bilgi Yapısı (Information Structure in Turkish). Unpublished PhD dissertation, Ankara University, Ankara.
- İşsever, S. (2003). 'Information Structure in Turkish: the word order-prosody interface'. *Lingua* 113(11): pp. 1025-1053.

- Jeon, M. (2008). Korean heritage language maintenance and language ideology. *Heritage Language Journal*, 6 (2), pp.54-71
- Johanson, L. (1999). Frame-changing code-copying in immigrant varieties. In G. Extra and L. Verhoeven (eds.), *Studies on Language Acquisition. Volume 14: Bilingualism and Migration*, pp. 247–60. Berlin: Mouton de Gruyter.
- Kail, M. & Hickmann, M. (1992). French children's ability to introduce referents in narratives as a function of mutual knowledge. *First Language*, 12, 73-94.
- Kalter, F., Granato, N. & Kristen, C. (2007), 'Disentangling recent trends of the second generation's structural assimilation in Germany', in S. Scherer, R. Pollak, G. Otte & M. Gangl (eds.), *From Origin to Destination*, 215-242. Frankfurt/ New York: Campus.
- Kaplan, R., & Bresnan, J. (1982). Lexical-functional grammar: a formal system for grammatical representation. In J. Bresnan (Ed.), *The mental representation of grammatical relations* (pp. 173-281). Cambridge: MIT Press.
- Kaplan, R. & Zaenen, A. (1989) Long-distance dependencies, constituent structure, and functional uncertainty. In Mark Baltin and Anthony Kroch, (eds), *Alternative Conceptions of Phrase Structure*. Chicago University Press, Chicago, pp. 17-42. Reprinted in Mary Dalrymple, Ronald M. Kaplan, John Maxwell, and Annie Zaenen, eds. 1995, 137- 165.
- Kaya, A. (2011). Euro-Turks as a Force in EU-Turkey Relations. *South European Society and Politics*, 16(3), 499-512.
- Kawaguchi, S. (2000). Acquisition of Japanese verbal morphology: Applying processability theory to Japanese. *Studia linguistica*, 54(2), 238-248
- Kawaguchi, S. (2005). Argument structure and syntactic development in Japanese as a second language. In Pienemann, M. (ed.), *Cross-linguistic Aspects of Processability Theory*, pp. 254-298. Amsterdam: John Benjamins.

- Kawaguchi, S. (2010). *Learning Japanese As a Second Language: A Processability Perspective*. Cambria Press.
- Keating, G., VanPatten, B. & Jegerski, J. (2011) "Who was walking on the beach? Anaphora resolution in Spanish heritage speakers and adult second language learners". *Studies in Second Language Acquisition* 33: 193-222.
- Keenan, E. (1985). 'Relative Clauses.' In: T. Shopen (ed) *Language typology and syntactic description*. Volume II. Complex constructions. Cambridge University Press, Cambridge, London, 141-170.
- Keenan, E. O., & Comrie, B. (1977): "Noun phrase accessibility and Universal Grammar." *Linguistic Inquiry*, Vol. 8/1 (1977): 63-99.
- Kempen, G., & Hoenkamp, E. (1987). An incremental procedural grammar for sentence formulation. *Cognitive Science*, 11, 201-258.
- Keßler, J.U. & Liebner, M. (2011). Diagnosing L2 development: Rapid Profile, in Pienemann, M. & Keßler, J.U. (eds.), *Studying Processability Theory*. John Benjamins, Amsterdam, pp.133-149
- Keßler, J.U. & Pienemann, M. (2011). Research methodology: how do we know about developmental schedules? In Pienemann, M. & J.-U. Keßler (eds.) (2011): *Studying Processability Theory. An Introductory Textbook*. Amsterdam: John Benjamins, pp. 84-99
- Ketrez, F. N. (1999). Early verbs and the acquisition of Turkish argument structure. *MA Thesis, Boğaziçi University, Istanbul*.
- Kılıçaslan, Y. (1994). Information Packaging in Turkish. Unpublished M.Sc. thesis, University of Edinburgh.
- Kıray, M. (1976). The family of the immigrant worker. In N. Abadan-Unat (ed.), *Turkish Workers in Europe 1960–1975*, pp. 210–34. Leiden, The Netherlands: Brill.
- Kim, J-H., Montrul, S., & Yoon, J. (2009). Binding interpretation of anaphors in Korean heritage speakers. *Language Acquisition*, 16, 3–35.

- Kristen, C., & Granato, N. (2007). The educational attainment of the second generation in Germany Social origins and ethnic inequality. *Ethnicities*, 7(3), 343-366.
- Kristen, C., Reimer, D., & Kogan, I. (2008). Higher education entry of Turkish immigrant youth in Germany. *International Journal of Comparative Sociology*, 49(2-3), 127-151.
- Knecht, L. E. (1985) Subject and object in Turkish. Unpublished PhD Thesis, Massachusetts Institute of Technology
- Kondo-Brown, K. (2003). Heritage language instruction for post-secondary students from immigrant backgrounds. *Heritage Language Journal*, 1,1-25.
- Kondo-Brown, K. (2004). "Do background variables predict students' scores on a Japanese placement test? Implications for placing heritage language learners". *Journal of the National Council of Less Commonly Taught Languages* 1: 1-19.
- Kondo-Brown, K. (2006). East Asian heritage language proficiency development. In K. Kondo-Brown (Ed.), *Heritage language development: Focus on East Asian immigrants* (pp. 243–258). Amsterdam: Benjamins.
- Kondo-Brown, K. (2010). Curriculum development for advancing heritage language competence: Recent research, innovations, and a future agenda. *The Annual Review of Applied Linguistics*, 30, 24-41.
- Kornfilt, J., (1997). Turkish. Routledge, London and New York.
- Kristen, C. and Granato, N. (2007). The educational attainment of the second generation in Germany: social origins and ethnic inequalities. *Ethnicities*, 7 (3), pp.343-366
- Kroeger, P. (2004) Analyzing Syntax, A lexical-Functional Approach, Cambridge University Press.
- Kural, M., (1992). Properties of scrambling in Turkish. Ms, draft 1. UCLA.

- Küntay, A. & Slobin, D. I. (1999). The acquisition of Turkish as a native language. A research review. *Turkic Languages*, 3, 151-188.
- Lee-Ellis, S. (2011). The elicited production of Korean relative clauses by heritage speakers. *Studies in Second Language Acquisition*, 33(1), 57-89.
- Lengyel, D. (2012). Early Childhood Education in Multilingual Settings. *International Handbook of Migration, Minorities and Education*, 169-185.
- Levelt, W. J. M. (1989): *Speaking: From intention to articulation*. Cambridge, Mass.: The MIT Press.
- Lewis, G.L. (2000) *Turkish grammar*. (2nd Ed.) Oxford University Press: Oxford, New York
- Liebner, M. And Pienemann, M. (2011): "Explaining learner variation." In *Studying processability theory: An introductory textbook*. edited by Pienemann, M and Kessler, J., Amsterdam: John Benjamins
- Lieven, E. (2010). Input and first language acquisition: Evaluating the role of frequency. *Lingua*, 120(11), 2546-2556.
- Li, C.N., Thompson, S.A., (1967). Subject and Topic: a new typology of language. In: Li, C.N. (Ed.), *Subject and Topic*. Academic Press, New York, pp. 457–589.
- Long, M. H. (1996). The role of the linguistic environment in second language acquisition . In W. R. Ritchie and T. J. Bhatia (eds), *Handbook of Second Language Acquisition*. San Diego: Academic Press, pp.413- 468.
- Lucassen, L. (2005). *The Immigrant Threat: The integration of old and new migrants in western Europe since 1850*. Chicago, IL: University of Illinois Press.
- Luchtenberg, S. (2010). Bilingualism and bilingual education and their relations to citizenship from a comparative German-Australian perspective. *Intercultural Education*, 13 (1), pp. 49-61

- Lynch, A. (2003). The relationship between second and heritage language acquisition: Notes on research and theory building. *Heritage Language Journal, 1*, 1–18.
- Mackey, A. and Gass, S. M. (2005) *Second language research : methodology and design*. Mahwah, NJ: Lawrence Erlbaum.
- MacWhinney, B. (2001). Emergentist approach to languages. In Bybee, J. & Hopper, P. (Eds.). *Frequency and the emergence of linguistic structure*. Benjamins: New York.
- Mansouri, F. (2005): "Agreement morphology in Arabic as a second language: Typological features and their processing implications." In Pienemann, M. (ed.) *Cross-linguistic aspects of Processability Theory*. Amsterdam: John Benjamins.
- Mayer, M. (1969). *Frog, Where Are You?* New York: The Dial Press.
- McClure, E. (1981). Formal and functional aspects of the code-switched discourse of bilingual children. In R. Durán (ed.), *Latino Language and Communicative Behavior*, pp. 69–94. Norwood, NJ: Ablex.
- Meisel, J. M. (1991). Principles of Universal Grammar and strategies of language use: On some similarities and differences between first and second language acquisition. In L. Eubank (Ed.), *Point -Counterpoint: Universal Grammar in the second language* (pp. 231– 276). Amsterdam: John Benjamins.
- Meisel, J., Clahsen H. & Pienemann, M. (1981). On determining developmental stages in natural second language acquisition. *Studies in Second Language Acquisition, 3*(1), 109-135.
- Montrul, S. (2001). The acquisition of causative/inchoative verbs in L2 Turkish. *Language Acquisition, 9*(1), 1-58.
- Montrul, S. (2002). Incomplete acquisition and attrition of Spanish tense/aspect distinctions in adult bilinguals. *Bilingualism: Language and Cognition, 5*, 39–68.

- Montrul, S. (2004). Subject and object expression in Spanish heritage speakers: A case of morphosyntactic convergence. *Bilingualism: Language and Cognition*, 7, pp.1-18.
- Montrul, S. (2006). On the bilingual competence of Spanish heritage speakers: Syntax, lexical-semantics and processing. *International Journal of Bilingualism*, 10, 37– 69.
- Montrul, S. (2007). Interpreting mood distinctions in Spanish as a heritage language. In K. Potowski & R. Cameron (Eds.), *Spanish in contact: Policy, social and linguistic inquiries* (pp. 23–40). Amsterdam: John Benjamins.
- Montrul, S. (2008). *Incomplete acquisition in bilingualism. Re-examining the age factor*. Amsterdam: John Benjamins.
- Montrul, S. (2009). Knowledge of tense-aspect and mood in Spanish heritage speakers. *International Journal of Bilingualism*, 13(2), 239-269.
- Montrul, S. (2010a). Current issues in heritage language acquisition. *Annual Review of Applied Linguistics*, 30, 3–23.
- Montrul, S. (2010b). How similar are L2 learners and heritage speakers? Spanish clitics and word order. *Applied Psycholinguistics*, 31, 167–207.
- Montrul, S. (2011). “Morphological errors in Spanish second language learners and heritage speakers”. *Studies in Second Language Acquisition* 33: 155-161.
- Montrul, S. (2012) Is the heritage language like a second language? Roberts, L., Lindqvist, C., Bardel, C. and Abrahamsson, N. (eds.), *EUROSLA Yearbook* (12), pp. 1–29
- Montrul, S., & Bowles, M. (2008). Negative evidence in instructed heritage language acquisition: A preliminary study of differential object marking. In *Proceedings of the 2007 Second Language Research Forum* (pp. 252-262).

- Montrul, S., & Bowles, M. (2009). Back to basics: Differential object marking under incomplete acquisition in Spanish heritage speakers. *Bilingualism: Language and Cognition*, 12, 363–383.
- Montrul, S., Foote, R., & Perpinan, S. (2008). Gender agreement in adult second language learners and Spanish heritage speakers: The effects of age and context of acquisition. *Language Learning*, 58, 503–553.
- Neidle, C. (1996). Lexical Functional Grammar. In *Proceedings of the ESSLLI*. pp. 107-128
- Noonan, Michael. (1977). "On subjects and topics." BLS II, pp. 372-386
- Nordlinger, R. (1998). *Constructive Case: Evidence from Australian languages*. Stanford, CA: CSLI.
- Oflazer, K. (1994). Two-level description of Turkish morphology. *Literary and linguistic computing*, 9(2), 137-148.
- Oflazer, K., Göçmen, E., Gocmen, E., & Bozsahin, C. (1994). An outline of Turkish morphology.
- O'Grady, W., Lee, M., & Choo, M. (2001). The acquisition of relative clauses by heritage and non-heritage learners of Korean as a second language: A comparative study. *Journal of Korean Language Education*, 12, 283-294.
- O'Grady, W., Lee, On-Soon. (2011). Practical and theoretical issues in the study of heritage language acquisition. *Journal of Korean Language Education*, 12, 283–294.
- O'Grady, W., Kwak, H. Y., Lee, O. S., & Lee, M. (2011). An emergentist perspective on heritage language acquisition. *Studies in Second Language Acquisition*, 33(02), 223-245.
- Orendt, M. (2010). The integration of the Turks into the German society: Turks on their way to parallel societies or to true integration? *Bilge Strateji*, 1 (3), pp. 141-156

- Orsolini, M., Rossi, F. & Pontecorvo, C. (1996). Re-introduction of referents in Italian children's narratives. *Child Language*, 23, 465-486.
- Özcan, V. (2004) Germany: Immigration in Transition. On [www.migrationinformation.org/Profiles/display.cfm?id=235](http://www.migrationinformation.org/Profiles/display.cfm?id=235). Accessed 10.10.2012
- Özdemir, B. (2004) Language development in Turkish-German bilingual children and the implications for English as a third language. MA thesis, University of Paderborn, Germany.
- Özsoy, A. S. (1990). Passive construction in Turkish. *Proceedings of the IVth National Linguistics Conference*. Boğaziçi University Publications; İstanbul.
- Özsoy, A. S. (2009). Argument structure, animacy, syntax and semantics of passivisation in Turkish: A corpus-based approach. Boğaziçi University Publications; İstanbul.
- Özsoy, S. and Erguvanlı-Taylan, E. (1989) Belirtlilik ve kavrami ve yabancı dil olarak Türkçe. In F. Özden, Ekmekçi and V, Ulku (eds) Dil Bilimi Uygulamaları (pp.187-203). Adana, Cukurova University.
- Öztürk, O., & Papafragou, A. (2008). The acquisition of evidentiality in Turkish. *University of Pennsylvania Working Papers in Linguistics*, 14(1), 23.
- Pallotti, G. (2007). An operational definition of the emergence criterion. *Applied Linguistics*, 28(3), 361-382.
- Papadopoulou, D., Varlokosta, S., Spyropoulos, V., Kaili, H., Prokou, S., & Revithiadou, A. (2011). Case morphology and word order in L2 Turkish: Evidence from Greek learners. *Second Language Research*. 27(2) 173-205
- Pfaff, C.W. (1991) 'Turkish in contact with German: Language maintenance and loss among immigrant children in Berlin (West). *International Journal of the Sociology of Language* 90, 97- 129.

- Pfaff, C. W. (1993). Turkish language development in Germany. In G. Extra and L. Verhoeven (eds.), *Immigrant Languages in Europe*, pp. 119–46. Clevedon, UK: Multilingual Matters.
- Pfaff, C.W. (1994) Early bilingual development of Turkish children in Berlin. In G. Extra and L. Verhoeven (eds) *The Cross-linguistic Study of Bilingual Development* (pp. 75-97). Amsterdam: Koninklijke Academie van Wetenschappen.
- Pfaff, C. W. (1997). Contacts and conflicts: Perspectives from code-switching research. In M. Pütz (ed.), *Language Choices*, pp. 341–60. Amsterdam: Benjamins.
- Pfaff, Carol W. (1999). Changing patterns of language mixing in a bilingual child. In G. Extra and L. Verhoeven (eds.), *Studies on Language Acquisition. Volume 14: Bilingualism and Migration*, pp. 97– 121. Berlin: Mouton de Gruyter.
- Pfaff, C. W. (2011) Multilingual Development in Germany in the Crossfire of Ideology and Politics: Monolingual and Multilingual Expectations, Polylingual Practices. *TRANSIT*, 7 (1)
- Pfaff, C. W. (2012), '(How) will Turkish survive in Northwestern Europe?' paper presented at *The 16th International Conference on Turkish Linguistics* Ankara, TURKEY September 18-21, 2012 <[http://www.ictl2012.metu.edu.tr/index\\_html\\_files/Carolpercent20Pfaff.pdf](http://www.ictl2012.metu.edu.tr/index_html_files/Carolpercent20Pfaff.pdf)
- Piaget, J. (1980). The psychogenesis of knowledge and its epistemological significance. In M. Piattelli-Palmarini (Ed.), *Language and learning. The debate between Jean Piaget and Noam Chomsky* (pp. 23-34). London: Routledge & Kegan Paul.
- Pienemann, M. (1998a). Developmental dynamics in L1 and L2 acquisition: Processability Theory and generative entrenchment. *Bilingualism: Language and Cognition*. 1, pp. 1-20
- Pienemann, M. (1998b). *Language processing and language development: Processability Theory*. Amsterdam: John Benjamins.

- Pienemann, M. (2005): "Discussing PT" In Pienemann, M. (ed) *Cross-linguistic aspects of processability theory*. Amsterdam: John Benjamins.
- Pienemann, M. (2007): "Processability Theory." In *Theories in second language acquisition: An introduction* edited by B. VanPatten & J. Williams. London: Lawrence Erlbaum.
- Pienemann, M. (2008) *A brief introduction to Processability Theory*. In: Keßler, J.-U. (ed.) (2008) *Processability Approaches to Second Language Development and Second Language Learning*. Newcastle, UK: Cambridge Scholars Publishing, 9-29.
- Pienemann, M. (2011): *Studying processability theory: An introductory textbook*. Amsterdam: John Benjamins.
- Pienemann, M., Di Biase, B., & Kawaguchi, S. (2005): "Extending processability theory." In Pienemann, M. (ed) *Cross-linguistic aspects of processability theory*. Amsterdam: John Benjamins.
- Pienemann, M. & Håkansson, G. (1999). A unified approach towards the development of Swedish as L2: A processability account. *Studies in Second Language Acquisition*, 21, 383–420.
- Pienemann, M., Johnston, M. & Brindley G. (1988). Constructing an acquisition-based procedure for second language assessment. *Studies in Second Language Acquisition*, 10, 217-243.
- Pienemann, M. & Mackey, A. (1993). "An empirical study of children's ESL development and Rapid Profile". In P. McKay (ed.), *ESL development. Language and literacy in Schools*, Vol. 2. Commonwealth of Australia and National Languages and Literacy Institute of Australia, 115-259
- Pires, A., & Rothman, J. (2009). Disentangling sources of incomplete acquisition: An explanation for competence divergence across heritage grammars. *International Journal of Bilingualism*, 13(2), 211-238.
- Piske, T., & Young-Scholten, M. (2009). *Input matters in SLA* (Vol. 35). Channel View Books.

- Polinsky, M. (1997). American Russian. Language loss meets language acquisition. *Proceedings of the Annual Workshop on Formal Approaches to Slavic Linguistics* (pp. 370-406). Ann Arbor, MI: Michigan Slavic.
- Polinsky, M. (2004) Word class distinctions in an incomplete grammar. In D. Ravid and H. Bat-Zeev Shyldkrot (eds) *Perspectives on Language and Language Development*. (pp. 419–436). Dordrecht: Kluwer.
- Polinsky, M. (2006). Incomplete acquisition: American Russian. *Journal of Slavic Linguistics*, 14, 191–262.
- Polinsky, M. (2007). Reaching the end point and stopping midway: different scenarios in the acquisition of Russian. *Russian linguistics*, 31(2), 157-199.
- Polinsky, M. (2008a). Russian gender under incomplete acquisition. *Heritage Language Journal*, 5, 2007.
- Polinsky, M. (2008b) Heritage language narratives. In D. Brinton, O. Kagan, & S. Bauckus (Eds.), *Heritage language education. A new field emerging* (pp. 149–164). New York: Routledge.
- Polinsky, M. (2008c.) Relative clauses in heritage Russian: Fossilization or divergent grammar? In A. Angtonenko, J. Bailyn, and C. Bethin (Eds.), *Annual Workshop on Formal Approaches to Slavic Linguistics* (pp. 333-358). Ann Arbor, MI: Michigan Slavic.
- Polinsky M. (2009) What breaks in A- and A-bar chains under incomplete acquisition. In: *CUNY Sentence Processing Conference*. UC Davis
- Polinsky, M. (2011). Reanalysis in adult heritage language. *Studies in Second Language Acquisition*, 33(02), 305-328.
- Polinsky, M., & Kagan, O. (2007). Heritage languages in the “wild” and in the classroom. *Language and Linguistic Compass*, 1, 368–395.
- Pullum, G., & Scholz, B. (2002). Empirical assessment of stimulus poverty arguments. *Linguistic Review*, 19, 9-50.

- Rahkonen, M. & Håkansson, G..2008. Production of written L2-Swedish - processability or input frequencies? In J.-U. Kessler (ed.), *Processability approaches to Second Language Development and Second Language Learning*. Cambridge Scholars Publishing: Newcastle, s. 135-161.
- Romanova, N. (2008). Mechanisms of Verbal Morphology Processing in Heritage Speakers of Russian. *Heritage Language Journal*, 6(1), 105-126.
- Ross, C. J. (2009) Perennial outsiders: the educational experience of Turkish youth in Germany. *American University International Law Review*. 24 (4), pp. 685-710
- Rothman, J. (2007) Heritage speaker competence differences, language change and input type: Inflected infinitives in heritage Brazilian Portuguese. *International Journal of Bilingualism*, 11, 359–389.
- Savaşır, I. & Gee, J. (1982) The Functional Equivalents of the Middle Voice in Child Language. *Proceedings of the Berkeley Linguistics Society*.
- Schaefer, S. (2005) "Germany: A Case Study of Failed Integration". In: Sarah Schaefer, Greg Austin and Kate Paker (eds.) *Turks in Europe: Why are we afraid?*, pp. 1-18. Foreign Policy Center, London.
- Scheele, A.F., Leseman, P.P.M., and Mayo, A.Y. (2010), The home language environment of monolingual and bilingual children and their language proficiency. *Applied Psycholinguistics*, 31, 117-140
- Schlyter, S. (1993). "The weaker language in bilingual Swedish-French children". In K. Hyltenstam & Å. Viberg (eds.), *Progression and Regression in Language. Sociocultural, Neuropsychological and Linguistic Perspectives*, pp. 289-308. Cambridge: Cambridge University Press.
- Slobin, D. I. (1973). *Cognitive prerequisites for the development of grammar*. In C. A. Ferguson and D. I. Slobin (eds.), *Studies of child language development*. New York: Holt Rinehart and Winston, pp.175-208.

- Slobin, D. I. (1977) Language change in childhood and in history. In J. Macnamara (ed.) *Language Learning and Thought* (pp. 185-214). London: Academic Press.
- Slobin, D. I. (1979): *Psycholinguistics* (2nd ed.): Glenview: Scott Foresman.
- Slobin, D. I. (1982). Universal and particular in the acquisition of language. In E. Wanner & L. Gleitman (Eds.), *Language Acquisition. The state of the art* (pp. 128–172). Cambridge: Cambridge University Press.
- Slobin, D. I. (1985). Crosslinguistic evidence for the language-making capacity. *The crosslinguistic study of language acquisition, 2*, 1157-1256.
- Slobin, D. (1986) The acquisition and use of relative clauses in Turkic and Indo-European languages. In D.I. Slobin and K. Zimmer (eds) *Studies in Turkish Linguistics* (pp. 273-294). Amsterdam/Philadelphia: Benjamins.
- Slobin, D. I. & Aksu, A. (1982) Tense, Aspect & Modality in the Use of Turkish Evidential. *Tense-Aspect: Between Semantics & Pragmatics*. Hopper, P.J. (ed) Amsterdam: John Benjamins.
- Song, S. (2011). Second-generation Turkish youth in Europe: Explaining the academic disadvantage in Austria, Germany and Switzerland. *Economics of Education Review. 30*, pp. 938-949
- Song, M., O'Grady, W., Cho, S., & Lee, M. (1997). The learning and teaching of Korean in community schools. In Y.-H. Kim (Ed.), *Korean language in America* (Vol. 2, pp. 111–127). Manoa, HI: American Association of Teachers of Korean.
- Soysal, L. (2008) The migration story of Turks in Germany: from the beginning to the end. In Kasaba, R. (Ed.) *Turkey in Modern World* (Vol. 4, pp. 199-225) Cambridge University Press
- Söhn, J. and V. Özcan (2006) 'The Educational Attainment of Turkish Migrants in Germany', *Turkish Studies* 7(1): 101–24.

- Strunk, J. (2005). Pro-drop in nominal possessive constructions. In Butt, M. and King, T.H. (eds.) *Proceedings of the LFG05 Conference*, University of Bergen
- Taneri, M.(1996) Türkçe'de İstemli /İstemsiz- Geçişsiz Edilgen Çatılar ve Ağaç fiemada Zorunlu Boğum X. *Dilbilim Kurultayı Bildirileri*, May 22-24 1996, İzmir: Ege Üniversitesi Basımevi, 47-66.
- Tomlin, R. (1995): "Focal Attention, voice, and word order: An experimental, cross- linguistic study." In *Word order in discourse* edited by P. Downing & M. Noonan. Amsterdam: John Benjamins.
- Tomlin, R. (1997): "Mapping conceptual representations into linguistic representations: the role of attention in grammar." In *Language and conceptualization* edited by J. Nuyts & E. Pederson. Cambridge: Cambridge University Press: 162-189.
- Topbas, S., Mavis, I. and Basal, M., (1997), Acquisition of bound morphemes: nominal case morphology in Turkish. In K. Imer and N. E. Uzun (eds), *Proceedings of the VIIIth International Conference on Turkish Linguistics*, 8, pp. 22– 36.
- Treffers-Daller, J., Özsoy, A. S. and van Hout, R. (2007) '(In)Complete Acquisition of Turkish Among Turkish-German Bilinguals in Germany and Turkey: An Analysis of Complex Embeddings in Narratives', *International Journal of Bilingual Education and Bilingualism*, 10: 3, pp. 248-276
- Tsimpli, I. M. and Sorace, A. (2006). Differentiating interfaces: L2 performance in syntax- semantics and syntax-discourse phenomena. *Proceedings of the Annual Boston University Conference on Language Development*, 30 (2), 653-664.
- Ullman, M. T. (2001). The neural basis of lexicon and grammar in first and second language: the declarative/procedural model. *Bilingualism: Language and Cognition*, 4(1), 105–122.
- Underhill, R. (1976). *Turkish Grammar*. Cambridge: the MIT Press.

- Vainikka, A., & Young-Scholten, M. (1994). Direct access to X'-theory: Evidence from Korean and Turkish adults learning German. In Teun Hoekstra & Bonnie D. Schwartz, (Eds.), *Language Acquisition Studies in Generative Grammar*, (pp. 265-316). Amsterdam: John Benjamins.
- Vainikka, A. and Young-Scholten, M. (2011). *The Acquisition of German. Introducing Organic Grammar*. Berlin/New York: Mouton de Gruyter
- Valdés, G. (1997). The teaching of Spanish to bilingual Spanish-speaking students: Outstanding issues and unanswered questions [The teaching of Spanish to Spanish speakers]. In M. C. Colombi & F. Alarcón (Eds.), *La enseñanza del español a hispanohablantes* (pp. 8–44). Boston, MA: Houghton Mifflin.
- Valdés, G. (2001). Heritage Language Students: Profiles and Possibilities. In J. Peyton, J. Ranard & S. McGinnis (Eds.), *Heritage Languages in America: Preserving a national resource* (pp. 37-80). McHenry, IL: The Center for Applied Linguistics and Delta Systems.
- Valdés, G. (2005). Bilingualism, heritage language learners and SLA research: Opportunities lost or seized? *Modern Language Journal*, 89, 410–426.
- Valdés, G., Fishman, J., Chavez, R., & Perez, W. (2006). *Developing minority language resources: The case of Spanish in California*. Clevedon, UK: Multilingual Matters.
- Vallduví, E., Engdahl, E., (1996). The linguistic realisation of information packaging. *Linguistics* 34, 459–519.
- Van der Heijden, H. (1999). Word formation processes in young bilingual children. In G. Extra and L. Verhoeven (eds.), *Studies on Language Acquisition. Volume 14: Bilingualism and Migration*, pp. 123–40. Berlin: Mouton de Gruyter.
- Van Der Lely, H. K. J. (1997). Narrative discourse in grammatical specific language impaired children; a modular language deficit? *Child Language*, 24, 221-256.

- Van Deusen-Scholl, N. (2003). Toward a definition of heritage language: sociopolitical and pedagogical considerations. *Journal of Language, Identity, and Education*, 2(3), 211-230.
- Verhoeven, L. (2004) Bilingualism and narrative construction. In S. Stromqvist and L. Verhoeven (eds) *Relating Events in Narrative, Volume 2: Typological and Contextual Perspectives* (pp. 435-454). London: Lawrence Erlbaum.
- Vigliocco, G., Butterworth, B., & Garrett, M. F. (1996). Subject-verb agreement in Spanish and English: Differences in the role of conceptual constraints. *Cognition*, 61, 261–298.
- Von Heusinger, K. & Kornfilt, J. (2005). The case of the direct object in Turkish: Semantics, syntax and morphology. *Turkic Languages* 9, 3-44.
- Yurdakul, G. and Bodeman, M. (2006) 'We Don't Want to be the Jews of Tomorrow': Jews and Turks in Germany after 9/11," *German Politics and Society*, 24 (2): 44-67
- Wallraff, G. (1988), *Lowest of the Low*. Translated by M. Chalmers. New York: Mandarin
- Wegmann, K.M. (2012), Shaping a new society: immigration, integration, and schooling in Germany. *International Social Work*, pp. 1-17
- Weist, R. M. (1989). Review of D. I. Slobin 'Crosslinguistic evidence for the language-making capacity and Bowerman, M., What shapes children's grammars?' *Journal of Child Language*, 16, pp 456-466
- Wexler, K. (1982). A principle theory for language acquisition. In E. Wanner & L. R. Gleitman (Eds.), *Language acquisition: The state of the art* (pp. 288-315). New York: Cambridge University Press.
- Wigglesworth, G. (1997). Children's individual approaches to the organisation of narrative. *Child Language*, 24, 279-309.
- Wiley, T. G. (2001). On defining heritage languages and their speakers. In J. K. Peyton, D. A. Ranard, & S. McGinnis (Eds.), *Heritage languages in*

*America: Preserving a national resource* (pp. 29-36). McHenry, IL/  
Washington, DC: Delta Systems/Center for Applied Linguistics.

Wimsatt, W. C. (1986). Developmental constraints, generative entrenchment and the innate-acquired distinction. In W. Bechtel (Ed.), *Integrating Scientific Disciplines* (pp. 185–208). Dordrecht: Martinus Nijhoff.

Wimsatt, W. C. (1991). Generative entrenchment in development and evolution. Ms., Dept of Philosophy, University of Chicago.

Xanthos, A., Laaha, S., Gillis, S., Stephany, U., Aksu-Koç, A., Christofidou, A., & Dressler, W. U. (2011). On the role of morphological richness in the early development of noun and verb inflection. *First Language*, 31(4), 461-479.

Zaenen, A. (1980). Extraction Rules in Icelandic. Ph.D. Thesis, Harvard University

Zawilska-Florczuk, M. (2010). Germany's policy towards immigrants - from integration to naturalisation. *Centre for Eastern Studies Commentary*, 32

Zhang, Y. (2005): "Processing and Formal Instruction in the L2 Acquisition of Five Chinese Grammatical Morphemes." in by Pienemann, M. (ed.) *Cross- Linguistic Aspects of Processability Theory*. Amsterdam / Philadelphia: John Benjamins: 155-77.