Representation and acquisition of stress: the case of Turkish

Öner Özçelik

Department of Linguistics

McGill University

Montréal, Québec, Canada

Dec. 2011

A thesis submitted to McGill University in partial fulfilment of the degree of Doctor of Philosophy (Linguistics)

ABSTRACT

This thesis investigates the representation and acquisition of word-level stress in Turkish. Two general proposals are made in the thesis, one related to formal phonology, the other about second language (L2) acquisition of word-level prosody. The first proposes that the presence/absence of the Foot is parametric; that is, contra much previous research (see e.g. Selkirk 1995, Vogel 2009), it is argued in this thesis that the Foot is not a universal constituent of the Prosodic Hierarchy; rather, some languages, such as Turkish and French, are footless. Several types of evidence are presented in support of this proposal, from both Turkish and French, with a focus on the former language. A comparison of regular (word-final) and exceptional stress in this language reveals, for example, that regular "stress" is intonational prominence falling on the last syllable of prosodic words in the absence of foot structure. Exceptional stress, on the other hand, is argued to be the result of certain morphemes coming into the computation already footed in the lexicon, and being footed on the surface, too, because of faithfulness to this information. The grammar, then, assigns the other properties of this foot, such as binarity and foot type, which are vacuously satisfied for regular morphemes, as they are not footed, and as the grammar has no mechanism that assigns feet or stress. The result is a unified analysis of regular and exceptional stress in Turkish.

Second, the thesis proposes a path for the L2 acquisition of prosody, the Prosodic Acquisition Path Hypothesis (PAPH). The PAPH predicts different levels of difficulty and paths to be followed by L2 learners based on the typological properties of their first language (L1) and the L2 they are learning, and also on the basis of a hierarchical tree representation of the relationships proposed to hold between prosodic parameters. Most foot-related parameters are incorporated in the proposal, as well as the new parameter

proposed in this thesis about the presence/absence of the Foot. The PAPH predicts that once the Foot is projected in an L1, learners of a footless L2 will not be able to expunge it from their grammar, but will, instead, be restricted to changing the values of foot-related parameters. Not every one of these parameters is, however, hypothesized to be equally easy to reset; depending on a variety of factors such as their location on the parameter tree and markedness, certain parameters, such as Foot-Type, are hypothesized to be easier to reset than others, such as Iterativity.

The predictions as concerns the learning path are tested through an experiment, which examines productions of English- and French-speaking learners of L2 Turkish. The results of the experiment largely confirm the predictions of the PAPH. None of the English-speaking learners of Turkish were able to rid their grammar of the Foot, though they were able to make various Universal Grammar (UG)-constrained changes to their grammar, such as resetting Extrametricality from *Yes* to *No*, and at later stages, Foot-Type from *Trochaic* to *Iambic*, thereby having increasingly more word types with final stress. French-speaking learners, on the other hand, produced target-like footless outputs, with word-final prominence, from the initial stages of acquisition. At no stage did any of the learners have UG-unconstrained representations such as weight-*in*sensitive iambs, which are not permitted by the inventory of feet provided by UG.

ABRÉGÉ

Cette thèse examine la représentation et l’acquisition de l’accent lexical en turc. Deux propositions principales sont avancées, la première concernant la phonologie théorique et la seconde, l’acquisition en langue seconde (L2) de la prosodie lexicale. Il est d’abord proposé que la présence ou l’absence d’un pied prosodique est paramétrique. Contrairement à ce qui est suggéré dans plusieurs travaux (Selkirk 1995, Vogel 2009), il est proposé dans cette thèse que le pied n’est pas un constituant prosodique universel. Au contraire, certaines langues, dont le turc et le français, ne possèdent pas de pied. Plusieurs arguments en faveur de cette position provenant de ces deux langues, en particulier du turc, sont avancés. La comparaison entre un accent régulier (sur la fin du mot) et un accent exceptionnel en turc révèle que «l'accent » est simplement une proéminence de l'intonation portant sur la dernière syllabe d'un mot prosodique en l'absence d'une structure de pied. L'accentuation exceptionnelle, en échange, est le résultat de l'introduction dans la computation de morphèmes déjà structurés en pieds dans le lexique. Cette structure de pied est maintenue en surface, suivant les contraintes de fidélité. La grammaire assigne ensuite les autres propriétés à ce pied, telles que la binarité et le type de pied. Ces propriétés sont satisfaites par défaut dans le cas des morphèmes réguliers, puisque ceux-ci ne sont pas structurés en pied. Le résultat est une analyse unifiée de l'accentuation normale et exceptionnelle en turc.

En deuxième lieu, cette thèse propose une voie pour l'acquisition L2 de la prosodie, que nous appelons l'Hypothèse de la Voie de l'Acquisition de la Prosodie (HVAP). L'HVAP prédit différents niveaux de difficulté et différentes voies d'acquisition en fonction des propriétés typologiques de la langue première (L1) de l'apprenant et de la

langue L2 visée, ainsi que sur la base d'un arbre de dépendance représentant les relations entre les paramètres prosodiques. La plupart des paramètres concernant les pieds sont incorporés dans cette analyse, en plus du nouveau paramètre régissant la présence ou l'absence de pied. L'HVAP prédit que si le pied est présent dans la L1, un apprenant L2 d'une langue qui ne possède pas de pied sera incapable de l'éliminer de sa grammaire et sera contraint de changer les valeurs de d'autres paramètres concernant les pieds. Ces paramètres ne sont pas tous également faciles à changer. Dépendamment de leur position dans l'arbre de paramètres et de l'effet de marquage, il est prédit que certains paramètres tels que le type de pied seront plus facile à changer que d'autres, comme l'Itérativité.

Les prédictions de cette théorie concernant la voie d'apprentissage sont ensuite testées à l'aide d'une expérience visant à examiner la production en turc d'apprenants ayant le français ou l'anglais comme langue première. Les résultats de cette expérience confirment largement les prédictions de l'HVAP. Aucun des apprenants du turc parlant l'anglais comme langue première n'ont été en mesure de se débarrasser du pied dans leur grammaire. Ils ont toutefois été capables de faire certains changements contraints par la Grammaire Universelle (GU), comme par exemple changer le paramètre d'Extramétricalité de *oui* à *non* et, à une étape subséquente, changer le type de pied de trochaïque à iambique, résultant en un nombre plus élevé de mots portant l'accent principal sur la dernière syllabe. Les apprenants francophones, en échange, produisent des structures sans pieds avec accent final, comme la cible en turc, à partir du début de l'acquisition. Aucun des apprenants n'ont présentés de structures non-contraintes par la GU tels que des pieds iambiques non-sensibles au poids prosodique, un type de pied exclu par la GU.

Acknowledgments

My deepest thanks go to my supervisor, Heather Goad, and my co-supervisor, Lydia White, for their ideas, support, guidance, availability and enthusiasm in every single one of my five years at McGill.

Heather represents everything one could expect from a supervisor, and more. She has been a great source of inspiration, has always been open to new ideas, and has done a great job in suggesting new directions in the most generous ways possible. Heather has always surprised me with her deep knowledge of both theoretical phonology and language acquisition, the kind of researcher I have always aspired to be. I could not have asked for a more ideal supervisor. Heather is and will always stay as my academic role model, both as a researcher and as a teacher. Taking her "Acquisition of Phonology" class was a turning point in my life; many of the ideas in my research, including some of the main arguments in this thesis, such as the parametric status of the presence/absence of the Foot, were inspired by this class. I also thank Heather for her constant search for perfection in every draft of this thesis, for carefully reading every single statement made in each chapter, and for always pushing me to do better. This thesis could not have been accomplished without your help, Heather. I have no idea how I can possibly thank you enough, after everything you did for me, whether related to the thesis or my academic development and achievement in general! As McGill linguistics undergrads simply put it, "In Goad we trust."

I would like to extend my profound gratitude to my co-supervisor, Lydia White, for her continuous support, guidance and encouragement throughout the program, and for reading my thesis chapters stunningly swiftly with very valuable comments. I also thank her for including me in a variety of research projects and helping me gain first hand research experience in the field of second language acquisition by working closely with her on every step of these projects, from writing abstracts to presenting at conferences and writing papers. The conferences we have attended together, the meals with plenary speakers (= you) and the increase in the number of audience attending my presentations whenever you were there and when I was known as “Lydia’s student” were some of the most fun parts of my last five years at McGill. Your ideas and teaching have greatly influenced my research and my view of myself as a linguist working on second language acquisition. I am proud that after so many years of reading your research, I had the chance to study with you at McGill, take your classes, and learn so much from you.

I am also very grateful to Michael Wagner for serving on my thesis committee and for his thoughtful input. I am especially thankful for his help and guidance with the analysis of the experimental data and very helpful suggestions about the direction of my thesis. Many thanks also to Glyne Piggott, my first phonology teacher at McGill, for always pushing me to do better and for valuable comments on several phonology papers, including my second evaluation paper, for which he was my second reader, along with Heather. Glyne is the one, together with Heather, to get me interested in stress and prosody in the first place.

A number of other current and past McGill linguistics professors with whom I took classes have significantly influenced my research and thoughts in the past five years: I would, in particular, like to thank Dan Silverman, Tanja Kupisch, Brendan Gillon, Andrea Gualmini and Maire Noonan. Dan’s phonology (=funology) class taught me alternative ways of analyzing phonological data. Thanks to Tanja and Brendan for serving on my first evaluation paper committee, and for very helpful classes on bilingualism and formal methods respectively. Thanks to Andrea Gualmini for a great class on L1 acquisition which inspired some of my research. I am also thankful to Maire Noonan for introducing me to Antisymmetric Syntax, and for the good times co-teaching a class together. Many thanks also to Fred Genesee, of McGill Psychology, for many fun and informative Language Acquisition Program (LAP) classes together; they were some of the most memorable parts of my McGill experience, and helped me view the field of language acquisition from a variety of different perspectives.

I would like to extend my gratitude to all the participants in my thesis experiments, as well as to Emre Ünlücayaklı and Şükran Fazlıoğlu for helping me with recruiting many of them; this dissertation would not have been possible without their help. Finding L2 learners of Turkish was certainly one of the most challenging parts of this thesis; the contribution of every single participant was, thus, very critical.

I am grateful for the financial support I received during my Ph.D. at McGill, including a Principal's Graduate Fellowship, an Eileen Peters Fellowship, Faculty of Arts Graduate Awards, Faculty of Arts Top-Up Fellowship, and a Recruitment Excellence Fellowship, as well as differential fee waivers. I am, in particular, grateful for support from several SSHRC and FQRSC research grants awarded to Lydia White and Heather Goad. I have also benefited from several travel awards throughout my Ph.D. enabling me to present my research at various conferences, including Faculty of Arts GREAT Travel Grant, Faculty of Arts Graduate Student Travel (GTS) Award, Alma Mater Travel Award, and CRLMB Travel Grants, and several SSHRC and FQRSC research grants awarded to Lydia White and colleagues.

I would like to thank some of the current and past McGill linguistics graduate student colleagues who offered help during the writing of this thesis: Special thanks to David-Étienne Bouchard for translating the French version of the abstract, as well as for his companionship over the years as the only other remaining member of my cohort in the department. Many thanks also to Bethany Lochbihler, Stephan Hurtubise and Mike Hamilton for rating the English oral proficiency test, as well as for many chats. Thanks also to Jozina Vander Klok for sharing with me her experience with designing oral proficiency tests. Thanks also to Fiona Campbell for offering help with rating the test. Many thanks to my long-time office mate, Moti Lieberman, for sharing many stories, academic and non-academic ideas, opinions about world problems and for making the office a fun place. Thanks to Mina Sugimura for many intensive thesis-writing sessions together. Thanks to Alyona Belikova, Larissa Nossalik and Tobin Skinner for valuable advice throughout the Ph.D. program. Thanks also to Chen Qu for her friendship throughout the years. Thanks to Tokiko Okuma for many encouraging remarks while writing the thesis. Thanks to Adèle-Elise Prévost for translating the French version of the background questionnaire. Thank you to my other graduate student colleagues, both past and present, who shared the graduate school experience with me: Mark Smith, Gustavo Beritognolo, Émile Khordoc, Eva Dobler, Eva Melkonyan, Athanasios Tsiamas and Walter Pedersen. Finally, thank you to all my students from several linguistics courses I TAed or taught at McGill; I have learnt as much from my teaching experience as I've learnt from books.

Thank you to the staff of the Linguistics department, especially Connie DiGiuseppe, Andria De Luca, Mercini McCollum, and Lauren Mak whose presence and support made the department a more enjoyable place. Special thanks, Connie, for lending me an extra fan during the hot summer months of intensive thesis writing and for always being the most efficient go-to person whenever I had questions no one knew how to answer!

A number of people from my days before McGill have greatly influenced my research and contributed to my development in the fields of phonology and second language acquisition. Special thanks to Alan Juffs, my MA thesis advisor, and to Robert DeKeyser, from whom I learnt a lot and continue to learn. Many thanks also to Suzanne Curtin, my first Phonology instructor, for getting me interested in phonology. Thanks also to Ayşe Gürel for introducing me to linguistic approaches to second language acquisition in my undergraduate years, as well as to Judy Monthie Doyum for her continuous emphasis on creativity and originality which continues to influence my teaching.

A very special thanks to Miho Nagai for always being there for me and for coauthoring many papers together. Finally, many thanks to my family; my mother, father and sister for their constant encouragement and support all through my life. I am especially indebted to my sister, Müberra, for her constant help with grammaticality judgments in Turkish whenever I couldn't trust my English- and linguistics-contaminated judgments.

Finally, thank you, Canada, (and particularly Québec and Montréal), for providing this foreigner with the opportunity to get education in your finest institution and for welcoming me in the best way a country can welcome a foreigner. None of this will ever be forgotten.

Table of Contents

Chapter 1: Introduction

This thesis investigates the representation and acquisition of word-level stress, focusing on Turkish. Two proposals are made in the thesis, one related to formal phonology, the other to second language (L2) acquisition. The first proposal is that the presence versus absence of the Foot is parametric; that is, contra much previous research (see e.g. Selkirk 1995, Vogel 2009), it is argued in this thesis that some languages, such as Turkish and French, are footless. The Foot, in other words, is not a universal constituent of the Prosodic Hierarchy. The second proposal is for an acquisition path for acquiring L2 stress, which I refer to as the Prosodic Acquisition Path Hypothesis (PAPH). The PAPH predicts different levels of difficulty and paths to be followed by L2 learners based on the typological properties of their first language (L1) and the L2 they are learning, and also on the basis of a hierarchical tree representation of the relationships that are assumed to hold between prosodic parameters. The PAPH predicts, among other things, that once a prosodic constituent, such as the Foot, is projected in an L1, it is impossible to expunge it from the grammar in learning a footless L2. It is, however, possible to reset parameters that act on the Foot, such as Foot-Type, Iterativity, etc., though certain parameters are hypothesized to be more difficult to reset than others depending on their location in the parameter tree. The predictions as concerns the learning path are tested through an experiment examining the productions of English- and French-speaking learners of L2 Turkish.

1.1 Background

Modern linguistic theory aims to account for how, on the basis of limited data, learners come to acquire the grammar of their language. Given the mismatch between the input a child receives and the output of the grammar, the input seems to underdetermine the child's unconscious knowledge of language. Generative approaches to the study of language maintain, therefore, that human language is constrained by the options made available by Universal Grammar (UG) (Chomsky 1981, Pinker 1984, 1994). That is, UG provides a set of principles and parameters according to which grammars are constructed. Acquisition of language, in this approach, is the result of a process of setting a finite number of parameters to their correct values on the basis of positive evidence. Since parameters are equipped with a limited number of (mostly binary) built-in options (i.e. settings or values), the learner's task is considerably facilitated.

It has been argued, in generative second language acquisition research, that L2 learners' grammars (interlanguages) are also constrained by the options made available by UG (White 1989, 2003). This is because abstract properties that L2 learners acquire can often not be induced from the ambient input nor can they be derived from the grammar of the first language. Access to UG can be maintained, as White (2003) argues, even if the linguistic competence of a given L2 learner differs from that of native speakers of the target language; as long as the learner reaches representations that are constrained by UG, and provided that these representations cannot be explained on the basis of the L1 grammar or instruction in the L2, their source can be attributed to the hypothesis that UG principles are in operation in interlanguage grammars.

On the other side of the debate is the emergentist position that complex linguistic generalizations can be arrived at on the basis of the input alone, without any recourse to UG principles or parameters (MacWhinney 1997, Ellis 2003, O'Grady 2003). Order of acquisition, on emergentist accounts, is not due to the complexity of the representations the language learner must build, but rather because of frequency considerations, such as how robust the ambient input is in cueing certain constructions.

In this thesis, while I agree that the presence of ambient input is, of course, necessary for acquisition, of both first and second languages, I argue, at the same time, that the prosodic structures L2 learners build can, by no means, be explained based solely on the primary linguistic data. Rather, they are constructed based on the options made available by UG. However, UG alone cannot determine the learning outcomes. L2 learners differ from L1 learners in that they bring to the acquisition process their L1 grammar, and all parameters at the initial state of L2 acquisition are set to their L1 values, with the possibility of subsequent parameter resetting (White 1985, 1989; Schwartz & Sprouse 1994, 1996).

Previous theoretical research on L2 acquisition has focused mostly on the explanation of how final knowledge can be acquired (though see e.g. Schwartz 2003, Unsworth 2005). In addition, I seek to investigate in this thesis predictions regarding the developmental *path* followed by L2 learners.

The issues mentioned above have been well-researched in the second language acquisition of syntax, morphology and semantics (see e.g. White 2003 for a comprehensive review). Less researched is the status of phonological grammars, particularly with respect to prosody (but see e.g. Broselow & Finer 1991, Archibald 1993, Pater 1997, Steele 2002). This is despite the fact that parameters of prosody exhibit intricate interactions in leading to surface stress patterns that far surpass the complexity of interaction seen in syntactic parameters (Dresher & Kaye 1990). Though there have been a number of studies acknowledging the difficulty of prosody and assigning a bigger role to L1 transfer in this area (see e.g. Broselow 1988, Eckman & Iverson 1993, Broselow & Park 1995, Hancin-Bhatt & Bhatt 1997, Archibald 1998, Goad 2002, Steele 2002, Goad & White 2004, 2006), not much research has been done on the acquisition of L2 stress: Previous research in this area is limited to a handful of papers, and has focused almost exclusively on L2 English (see e.g. Archibald 1992, 1993, Pater 1997, Tremblay 2007).

L2 acquisition of stress in languages such as Turkish and French, which have fixed word- and phrase-final stress, respectively, has almost never been investigated. There appears to be no published research on the L2 acquisition of stress in Turkish. The same is true for French, except, to my knowledge, for two studies, Guilbault (2002) and Fogle (2009). One reason for this trend may be the assumption that, in languages that *consistently* have word- or phrase-final "stress" like Turkish and French, acquisition should be quite easy, i.e. error free, so that it will not provide much insight into the abstract generalizations made by L2 learners. As I will show in this thesis, however, the acquisition task in these languages is far from being simple; rather, I propose that it is far more difficult to acquire a system like Turkish or French, if the L1 has a true stress system like English, rather than vice versa. Neither the apparent simplicity of such systems nor conscious knowledge of the consistent stress patterns they display will, in certain well-defined contexts, be helpful to learners in ridding their interlanguage grammars of L1 interference.

There is, in fact, anecdotal evidence that this is true, that learning prominence systems of languages like Turkish and French brings its own difficulties, despite lack of concrete research findings. For example, L2 speakers of Turkish, with European L1s, are known to produce Turkish words with nonfinal accent, and when they do produce final accent at advanced levels, final syllables are perceived to be much more prominent than in the speech of native Turkish speakers. Such perceptions are reflected by Turkish movies where foreign accent is imitated primarily by means of placing stress on non-final syllables. Likewise, for French, the following statements made in an introductory book for undergraduate linguistics students are informative in this regard: Fromkin, Rodman, and Hyams (2010) write, based on observation, "when native English speakers attempt to speak French, they often stress syllables, so that native French speakers hear French with an 'English accent' " (p. 252-253). This, they compare with French-speaking learners of English, who, they say, "fail to put stress where a native speaker would;" that is, French-speaking learners of English do not have difficulties with stress as such, but their problems are, rather, with stressing the correct syllable. Even so, advanced French-speaking learners of English have been demonstrated to have reset their parameters, and attain target-like representations (see e.g. Pater 1997). The crucial question, though, is whether English-speaking learners of French can similarly learn *not* to stress syllables in French words. It appears that no empirical answer has so far been given to this question.

It is in this context that this thesis investigates the second language (L2) acquisition of word-level stress, examining productions of English- and French-speaking learners of L2 Turkish. The following two sections present a summary of the two main proposals to be made in this thesis, which have been briefly mentioned at the beginning of this chapter, as well as overviewing the issues discussed in each of the remaining six chapters of the dissertation.

1.2 Representation of "stress" in Turkish, French and English

It is commonly assumed that the Foot is a universal constituent of the Prosodic Hierarchy (see e.g. Selkirk 1995, Vogel 2009). In this thesis, I argue, contra previous approaches, that the presence/absence of the Foot is parametric; whereas some languages, such as English, require every prosodic word (PWd) to have at least one foot, other languages, such as Turkish and French, are footless. I present several types of evidence in Chapters 2 and 3 in support of this position, including the following: (i) some languages, such as Turkish and French, show no phonetic evidence of foot structure, (ii) the first utterances of children learning footed languages do not contain any evidence of the Foot and appear to be footless, and (iii) languages like Turkish, which has both regular and exceptional stress, provide formal evidence of lack of foot structure.

To illustrate the third point, I argue, in Chapter 2, that Turkish is a language whose grammar does not assign foot structure, though, under some exceptional cases, certain syllables are footed, for they come into the computation already footed in the lexicon. The grammar then ensures that this foot is trochaic and binary. To give an example, the words [gel-mé] "coming" and [gél-me] "don't come" contrast in Turkish by virtue of the fact that the first word has regular, final "stress" whereas the second has an exceptional suffix that is pre-stressing. I assume that the first case is footless, and that intonational prominence falls, by default, on the final syllables of prosodic words (PWds), since the grammar itself does not parse syllables into feet. The second word, on the other hand, has a suffix with an underlying foot, i.e. /(me)$_{Ft}$/, and given that the grammar is trochaic and binary, when –me is attached to a word, it surfaces as pre-stressing. Therefore, a unified account is possible of the regular final "stress" and the exceptional stress. The grammar is trochaic and binary, among other things, but it cannot parse syllables into feet, and in the absence of foot structure, final syllables of words receive intonational prominence, which is footless. This proposal is supported by the fact that whereas exceptional stress is cued by both intensity and a sharp F0 rise (typical of trochaic languages), regular final "stress" is nothing more than an optional slight rise in F0 (e.g. Konrot 1981, 1987). Further, the trochaic (and binary) status of the grammar is evidenced by the fact that monosyllabic exceptional suffixes are always pre-stressing (never stressed or post-stressing), whereas only bisyllabic exceptional suffixes can bear stress, and when this happens, it is always the first syllable of a bisyllabic exceptional suffix that bears stress, never the second (Özçelik 2009, to appear).

Chapter 3 presents evidence for the footless status of French. Several arguments are presented in support of this position, such as the fact that, in French, the domain of obligatory prominence is the Phonological Phrase (PPh), not the Prosodic Word (PWd); in a PPh consisting of several PWds, therefore, nonfinal PWds can surface without any kind of stress or prominence (Jun & Fougeron 2000, Post 2003), meaning that, at least for non-final PWds, one cannot assume stress or foot structure. In addition, even the PPh-final prominence in French is sometimes not produced (Jun & Fougeron 2000, Féry 2001). In view of facts like these, some researchers have already argued that French has no stress, but instead demarcative cues to the edges of prosodic constituents (e.g. Beckman 1986).

As for English, the third language that is relevant in this thesis, I assume, as with perhaps all previous research, that it differs from Turkish and French in that it requires every lexical word to be footed. The complex stress system of English that is borne out through the application of several foot-related prosodic parameters is also described in Chapter 3 through an analysis of the settings of each of these parameters.

1.3 Acquisition of stress

Given the differences between these three languages, and given the Prosodic Acquisition Path Hypothesis (PAPH), which proposes a specific learning path for prosody (see Chapter 4), different predictions can be made for English- and French-speaking learners of L2 Turkish. I assume that the initial state of L2 acquisition involves the L1 settings of parameters, in accordance with the Full Transfer Full Access (FTFA) Hypothesis (e.g. White 1989b, Schwartz & Sprouse 1994, 1996).

The predictions of the PAPH, however, go beyond the L1 English/French and L2 Turkish context that is tested in this thesis. It has overarching predictions, relevant for the L2 acquisition of any language. As described in Chapter 4, the proposal has three main parts to it, the combined effect of which is the prediction of a learning path for prosody by L2 learners. One of the main tenets of the PAPH is the hypothesis that once a prosodic constituent, such as the Foot, has been projected in an L1, learners of a language without that prosodic constituent (i.e. a footless L2) will not be able to eliminate it from their grammar. As far as L2 acquisition is concerned, it should always be easier, for this reason, to move from a footless language to one that requires feet than vice versa, the definition of a "footless language" being one that permits a lexical word to have no syllables that are footed (i.e. both French and Turkish), and a foot-requiring language being one that requires at least one syllable in every lexical word to be footed (e.g. English, Spanish).

The two other main tenets of the PAPH follow from the organization of prosodic parameters into a *tree* where some parameters are embedded under others. This predicts a prosodic learning path for L1 and L2 acquisition, as well as ensuring that some foot-related parameters are *open* (i.e. not *pre*-set to a certain value, e.g. End-Rule is open in an Unbounded grammar) and can *stay* as such. Once a parameter is activated (i.e. set to one value or another) in an L1 though, it should be impossible to deactivate it (i.e. make it open again) in an L2 where this parameter is not relevant. On the other hand, resetting parameters from one value to another (as long as it does not result in a prosodic constituent being removed from the grammar) is predicted to be possible. That is, though deactivation is *not* possible, resetting *is*, on this account, forming, respectively, the second and third main parts of the proposal. Not all types of resetting, though, are hypothesized to be equally easy: Certain parameters are expected to be more difficult to reset than others, on grounds of economy, markedness, and robustness of the input, which, as we will see later, is reflected in part by their location on the tree of parameters proposed in this thesis. Resetting parameters with embeddings, which leads to the de-facto deactivation of the parameters that depend on them, is hypothesized to be highly costly.

Taken together, the three main arguments of the proposal predict, in the case of L1 English-speaking learners of L2 Turkish, that in the absence of being able to get rid of the Foot or deactivating parameters that do not play a role in the L2, these learners will be restricted to changing values of parameters that have already been set in the L1 (such as changing Foot-Shape from Trochaic to Iambic, instead of producing footless outputs), even at advanced levels, as opposed to L1 French-speaking learners of Turkish, who are expected to be target-like from the initial stages of language acquisition. Changing parameter values will make English-speaking learners' interlanguage outputs similar, on the surface, to the target language, especially at advanced levels, though it will never make them structurally target-like.

The prediction that English-speaking learners will never be structurally target-like does not, however, mean that they do not have access to UG; only if the strategies they employ are those that are not within the scope of options permitted by UG can we draw such a conclusion (White 2003). Learners are predicted not to resort to such options on the current proposal, as UG is assumed to be available in L2 acquisition.

In order to test these predictions, a semi-controlled production experiment was conducted with English- and French-speaking learners of Turkish, as described in Chapter 5. More specifically, the experiment aimed to identify whether or not, in their production of Turkish words, learners use foot structure, and if so, what kind of footing they use (e.g. trochaic or iambic, iterative or not, weight-sensitive or not, etc.). For all bisyllabic and trisyllabic stimuli, weight profiles of each syllable were controlled, resulting in 4 bisyllabic and 8 trisyllabic conditions. These represented all possible Light (L) and Heavy (H) syllable combinations. This is crucial, because it is impossible to gain clear insight into a speaker's prosodic grammar without looking at a variety of syllable combinations. For example, looking only at stress patterns such as ĹL and H́LH, one cannot necessarily infer that the speaker has a trochaic grammar, as in [(ĹL)] and

[(H́L)H] (or [(H́)LH] if the language is additionally weight-sensitive); it could also be that the grammar here is iambic and weight-sensitive, with Extrametricality set to *Yes*, as in [(Ĺ)<L>] and [(H́)L<H>]. More patterns, therefore, need to be tested in order to have clear insight into a learner's grammar.

The results of the experiments, as described in Chapter 6, largely confirm the predictions of the PAPH. None of the English-speaking learners of Turkish was able to rid their grammar of the Foot, though one, the most advanced learner, produced some outputs that appeared to be footless. Despite being unable to expunge the Foot from their grammar, most of the English-speaking learners were able to make various changes to their grammar, such as resetting Extrametricality from *Yes* to *No*, thereby allowing final syllables to be stressed at least when they are heavy, in the case of learners with trochaic grammars. Most of the English-speaking subjects made this change, except for the learners at the very initial stage, who were basically using the L1 settings of all parameters, including Extrametricality. There were also learners who changed trochees to iambs (i.e. by resetting Foot-Type), thereby having even more words with final stress. Since Weight-Sensitivity was still set to *Yes* for these learners, as in the L1 (and as with the typical iambic grammar), they had nonfinal stress in cases where a final L was immediately preceded by an H, e.g. [(H́)L], [(H̀)(H́)L], [(LH́)L]. Some of the learners with iambic grammars, usually at higher levels of proficiency, had, however, even more words with final stress. This, they achieved, not by resetting Weight-Sensitivity from *Yes* to *No*, as one might readily imagine, but rather, by lengthening final Ls, thereby turning them into Hs. Learners resorting to this option had final stress in almost all experimental words. Only one learner, the most advanced among all subjects, was, however, able to reset Iterativity from *Yes* to *No*, consistent with the predictions of the PAPH (since Iterativity is a parameter with embeddings, and is, thus, predicted to be difficult to reset, unlike most other parameters).

None of the English-speaking learners were, however, able to expunge the Foot from their grammar, as indicated by the results of acoustic measurements, among other things. In words composed of LL weight profile, for example, whereas the French-speaking subjects, like native Turkish speakers, used neither intensity nor duration as a correlate of stress/prominence, suggesting that they had intonational prominence, the English-speaking subjects behaved differently, in ways that could be categorized into two different groups: those who used intensity and those who used duration. English-speaking learners who had trochaic grammars and thus stressed the first syllable of a target LL word had significantly greater intensity (and to some extent higher pitch) accompanying this syllable. English-speaking learners who had iambic grammars and thus stressed the second syllable of such words, on the other hand, used duration, but not intensity. English-speaking learners had final stress, in other words, rather than final (intonational) prominence, when they did make final syllables more prominent.

At no stage, on the other hand, did learners have such UG unconstrained representations as weight-*in*sensitive iambs, where heavy syllables are in the dependent position of the foot, which are considered not to be permitted by the inventory of feet provided by UG (see e.g. Hayes 1995), even though this could have been an easy way of achieving consistent word final stress in iambic grammars, as well as one that makes sense pedagogically in that all final syllables would then simply bear stress. What some learners did, instead, was, as mentioned above, to lengthen word-final vowels, thereby creating a heavy syllable at the end of every word. This, in turn, resulted in - as resetting Weight-Sensitivity to *No* would - close to 100% final stress in iambic grammars, for under this grammar, though the language is still weight-sensitive, every PWd ends in a heavy syllable, which can then be stressed in weight-sensitive systems.

As the discussion above reveals, most English-speaking learners had representations that were neither like the L1 nor the L2, and could, thus, not have been reached solely through L2 input or the L1 grammar, nor through instruction. If L2 input alone drove changes in learners' grammars, without being informed by UG, there would be no reason to demonstrate stage-like behavior in this way, or to have intermediate stages where some words are stressed on their final syllables, but some are not. If input alone drove the changes in interlanguage grammars, the fact that final syllables are more prominent in Turkish would, by itself, have led learners to stress the final syllables of all Turkish words, instead of causing them to restructure their grammar on a parameter-by-parameter basis, whose end result is only a proportional increase, each time, in the number of word-final syllables that are stressed, an increase that is in line with changes made in the grammar, not a rise that can be predicted from factors such as frequency. All this shows, as will be covered in more detail in Chapter 7, that the hypothesis space for the options to be employed by second language learners is constrained by UG.

In addition, this study shows that learnability research in L2 acquisition can also benefit from observation of the developmental paths followed by language learners and can, in turn, inform our knowledge of such paths. When many parameters interact in leading to certain surface results, as with the parameters of prosody examined in this thesis, it is possible to have a closer insight into learnability issues by way of examining the changes learners make in the values of each parameter.

Finally, there are other things that are predicted not to occur under the current proposal, those that are *specific* to the current account, i.e. those that would be allowed by UG for L1 learners. For example, certain learning paths, and interlanguage grammars attained through such paths, are predicted not to occur, even though such grammars fall within the scope of options permitted by UG. An example would be an interlanguage grammar of an English-speaking learner of Turkish where a parameter that is predicted to be difficult to reset according to the PAPH, such as Iterativity (a parameter with embeddings), has been reset (from *Yes* to *No*), whereas a parameter that is predicted to be easier, such as Foot-Type or Extrametricality (both terminal parameters with no embeddings), keeps its L1 value. Only after making easier changes are learners expected to resort to the options predicted to be more difficult on the PAPH, even if UG does not prevent such options.

All things considered, the PAPH is an attempt at proposing a restrictive and a falsifiable account of L2 prosody: Not only does it predict certain things to happen, but it also predicts certain things *not* to happen, even when they would be allowed by UG for L1 learners. In addition, it attempts to investigate the developmental paths of language learners, as well as the end point.

Chapter 2: "Stress" in the target language: Turkish

It is commonly assumed that the Foot is a universal constituent of the Prosodic Hierarchy (see e.g. Selkirk 1995, Vogel 2009). This is despite the fact that (i) some languages, such as Turkish and French, show no phonetic evidence of foot structure, and (ii) the first utterances of many children have been found to contain no evidence of the Foot. In this and the following chapter, I argue, contra previous approaches, that the presence/absence of the Foot is parametric; whereas some languages, such as English, require every prosodic word (PWd) to have at least one foot, other languages, such as Turkish and French, are footless. Whereas French is uniformly footless, Turkish has foot structure in exceptional cases, cases where a morpheme is footed in the input. I also provide the full set of parameters relevant for word-level stress/prominence in the three languages that are under concern in this thesis, Turkish, French and English respectively. The parametric system that I use is essentially the one employed by Hayes (1981) and Selkirk (1980) (see also Dresher & Kaye (1990)). The current chapter is focused on Turkish, and the following, Chapter 3, on French and English. Chapter 3 also presents additional evidence for the parametric status of the Foot, first from a cross-linguistic perspective and then from the literature on first language (L1) acquisition and bilingualism.

We start with Turkish, the sole focus of the current chapter. I propose a unified analysis of Turkish stress. I argue that the so-called regular (word-final) "stress" in Turkish is intonational prominence, falling on the last syllable of the PWd, and does not involve foot structure. Exceptional stress (mostly pre-stressing suffixes), on the other hand, does involve foot structure (trochaic). A single grammar is proposed to capture the two types of stress. It is argued that the Turkish grammar does not assign foot structure, but if certain morphemes are already footed in the input/underlying representation (UR), they are footed in the output/surface representation (SR), too, because of faithfulness to this information, thereby resulting in exceptional stress. The entire Turkish grammar is trochaic under this approach, but trochaicity is satisfied vacuously for regularly stressed morphemes, for the grammar cannot assign foot structure and these morphemes are underlyingly footless.[1]

The remainder of this chapter is organized in the following way: Section 2.1 introduces the Turkish data that usually appear in the literature. Section 2.2 presents the current account, and shows how it captures these data. Section 2.3 presents additional evidence for this account from higher-level prosodic structure. Section 2.4, then, overviews previous accounts of Turkish stress and compares them with the current account.

2.1 Turkish stress

2.1.1 Regular stress

Primary stress in Turkish falls on the final syllable of words (e.g. Lees 1961, Lewis 1967, Underhill 1976, Sezer 1983, van der Hulst & van de Weijer 1991, Inkelas 1994, 1999, Hayes 1995, Inkelas & Orgun 1995, 1998, Kabak & Vogel 2001). This is illustrated in (1), where stress moves to the right each time a new

[1]A version of this proposal was presented at NELS 40 (Özçelik 2009), and will appear in the *Proceedings of NELS 40*. The most significant difference between the two proposals is that the current one uses parameters instead of constraints. The reason for the use of parameters will be motivated in Chapter 4.

suffix is added, irrespective of the length of the word or the rhyme profile of the syllables involved:

(1)

a.	b.	c.	d.	e.
tabák	tabak-lár	tabak-larɨ́m	tabak-lar-ɨm-dá	tabak-lar-ɨm-da-kí
plate	plate-Pl	plate-Pl-my	plate-Pl-my-on	plate-Pl-my-on-one
‘plate’	‘plates’	‘my plates’	‘on my plates’	‘one on my plates’

2.1.2 Exceptional stress

When stress is non-final in Turkish, it is considered to be exceptional (see e.g. Kaisse 1985, 1986, van der Hulst & van de Weijer 1991, Inkelas & Orgun 1995, 1998, Kabak & Vogel 2001). There are two main types of exceptional stress in Turkish. One involves *roots*, which are pre-specified for stress. The other involves a set of *suffixes*. The focus in this chapter, as with most previous research, is on the latter.

2.1.2.1 Pre-stressing suffixes

There are two types of exceptional affixal stress in Turkish. One involves the so-called *pre-stressing* suffixes (the most widely researched type of exceptional stress in Turkish). The syllable immediately preceding these suffixes gets stressed (again irrespective of its rhymal profile), or on certain accounts (e.g. Kabak & Vogel 2001), stress placement on or following these suffixes is prevented. This is shown in (2); in each case, exceptional suffixes are underlined:

(2)	a. dinle-dí	b. dinle-dí-de	c. dinlé-me-di	d. dinlé-me-dì-de
	listen-PAST	listen-PAST-too	listen-NEG-PAST	listen-NEG-PAST-also
	‘He listened.’	‘He listened, too.’	‘He didn’t listen.’	‘He didn’t listen, either.’

2.1.2.2 Stressed suffixes

The other type of exceptional affix involves a smaller set of *stressed* suffixes. These are always stressed on their first syllable, regardless of this syllable’s rhyme shape (compare (3a) and (3b-c)) and irrespective of what follows (see (3d)). All of them are bisyllabic, i.e. no monosyllabic stressed exceptional suffix exists (see also Inkelas & Orgun 2003), which has important consequences for our analysis, as we will see in the next section.

(3)	a. gel-ínce	b. gel-érek	c. gel-íyor	d. gel-íyor-du-lar
	come-when	come-by	come-PRES.CONT.	come-P.C-PAST-Pl
	“when he/she comes”	“by coming”	“He/she is coming.”	“They were coming.”

Several researchers have attempted to account for the facts in (2) and (3), mostly, as mentioned, focusing on pre-stressing suffixes (see e.g. van der Hulst & van de Weijer 1991, Inkelas & Orgun 1998, Inkelas 1999, Kabak & Vogel 2001). None of these studies consider secondary stress (which arises when there is more than one exceptional stress attracting suffix, see (2d), see also Revithiadou et al., 2006). Further, the fact that different phonetic cues are associated with regular vs. exceptional stress has not been accounted for: Whereas exceptional stress is cued by both a sharp F0 rise and greater intensity, final prominence involves, at best, only a slight rise in F0 (Konrot 1981, 1987, Levi 2005, Pycha 2006). In addition, puzzling questions such as why monosyllabic exceptional suffixes are always pre-stressing (i.e. never stressed like those in (3)), and why stressed exceptional suffixes are always bisyllabic and are always stressed on their initial syllable (see

(3)) have typically been left unanswered. The current account strives to answer all of these questions.

2.2 Overview of the current account

On the current account, one single grammar underlies the two types of exceptional stress, as well as regular final stress. I propose that the exceptional stress pattern in Turkish indicates that Turkish is a trochaic language (see also Inkelas & Orgun 1998, Inkelas 1999), given that these suffixes are mostly *pre*-stressing, and never *post*-stressing (see (2)), and, if ever stressed, as in (3), they are always bisyllabic and stressed on the first syllable, never on the second. I argue, on the other hand, that the so-called final "stress" in Turkish is not stress at all, but rather is intonational prominence associated with the end of a PWd; thus, formally, it is a boundary tone (see Pierrehumbert 1980, Pierrehumbert & Beckman 1988, Gussenhoven 2004). This is supported by the fact that regular vs. exceptional stress in Turkish have different phonetic cues (see above).

The two systems (final vs. exceptional stress) do not, however, belong, on the current account, to different cophonologies (e.g. Inkelas & Orgun 1998) nor are exceptional affixes morphemes that are targeted by lexically indexed constraints (e.g. Pater 2000). In fact, I argue that one single grammar can capture both exceptional and regular final stress: I propose that Turkish is a trochaic but footless language, and thus, in the absence of feet, Trochaicity is vacuously satisfied. As a result, given a mechanism that assigns final prominence, more often than not, stress (or rather intonational prominence) will fall on the final syllable of the prosodic word, resulting in so-called regular stress. On the other hand, certain syllables (e.g. exceptional suffixes) come into the computation as footed in the input, and have to be parsed in the output, too because of faithfulness to this information, resulting in exceptional stress. Crucially, it is not the location of a stressed syllable that is pre-specified in the UR, but, rather, edges of feet, for exceptionally stressed morphemes.

This, then, is the only difference between regular and exceptional suffixes: While both are subject to the same grammar, the latter differ in that they are already footed in the input. Below, I analyze both types in more detail; I start with regular stress.

2.2.1 Regular "stress" as intonational prominence

As stated above, I analyze Turkish final stress as intonational prominence falling on the last syllable of the PWd. In addition to its descriptive and explanatory advantages (more on this later), there are two types of independent motivation for this, which can be categorized under inclusionary and exclusionary criteria as follows.

2.2.1.1 Inclusionary criteria

Inclusionary criteria include, first of all, the fact that the acoustic cues for the two types of prominence (final vs. exceptional) are not the same; as mentioned above, whereas exceptional stress seems to be true foot-based stress in that it is cued by both a sharp F0 rise and greater intensity (Konrot 1987, Levi 2005, Pycha 2006), final prominence is, at best, marked only a slight rise in F0 (Levi 2005, Pycha 2006). For some speakers, there is no rise at all; there is instead only a plateau

(Levi 2005). In fact, some studies report no robust phonetic correlates whatsoever for final "stress" (see e.g. Konrot 1981, 1987). All of this seems to suggest that final stress in Turkish is nothing more than a slight optional pitch rise, which, unlike non-final (exceptional) stress, is not accompanied by intensity. Languages that mark prominence only by a pitch rise are classified, by several researchers, as pitch-accent languages, and not as stress-accent. The latter use duration and intensity, in addition to F0 (see e.g. Beckman 1986, Ladd 1996, Hualde et al. 2002 for more information on the categorization of languages into stress-accent vs. pitch-accent). In addition, metrical prominence in stress-accent languages is obligatory; every word must have at least one stressed syllable, whereas optionality of the type observed in Turkish regular "stress" is permitted in pitch-accent languages (Hualde et al. 2002, Hyman 2006). Finally, the fact that non-final (exceptional) stress is not accompanied by duration (i.e. it is cued, in addition to a sharp F0 rise, only by intensity) is not surprising if it is trochaic, as I argue here. Trochaic feet tend to be even cross-linguistically; i.e. heads are not greater in duration than non-heads or other unstressed syllables, and duration differences, if any, are lost or are minimal (Hayes 1995, Kager 1999; though see e.g. Piggott 1995, 1998, Mellander 2003).

Can we conclude, then, based on the above discussion, that Turkish final prominence is formally *pitch-accent*? The answer is no, for pitch accents are intonational tones that appear on or near accented syllables (Gussenhoven 2004). If final prominence in Turkish were pitch-accent, we would expect it to move to the stronger exceptionally stressed syllable in contexts where there is an exceptional (pre-stressing or stressed) suffix, and therefore, we would expect no secondary stress (or rather prominence) on the final syllable in such words. This does not, however, seem to be the case; in words with exceptional stress that are long enough, final syllables bear secondary stress (see Revithiadou et al. 2006). From this, we can conclude that the intonational tone is not pitch-accent, but is instead a boundary tone, which is phonetically the same as a pitch-accent, but is attracted to the edges of prosodic constituents (see e.g. Pierrehumbert 1980, Pierrehumbert & Beckman 1988, Gussenhoven 2004 for discussion of how to categorize an intonational tone as a pitch-accent vs. a boundary tone).

This fact constitutes an additional inclusionary criterion to categorize Turkish final prominence as intonational prominence, for intonational prominence of the pitch-accent type might be confounded by 'stress', since the two usually co-occur, but a boundary tone can be nothing other than intonational prominence, especially if it occurs *in addition to* the other type of (trochaic) stress (i.e. in the same word). In fact, Gussenhoven (2004) argues that while not all languages show the phonetic effects of foot structure, or stress, in the same way, "it would be entirely unexpected to find a language that realized stressed syllables in phonetically conflicting ways" (p. 15). The acoustic studies on Turkish final vs. non-final stress have findings that are clearly in this direction, which is, in Gussenhoven's words, "unexpected," if the two types of prominence are both considered "stress" (i.e. foot-based prominence). I have argued, in this section, that they are not, and that final prominence in Turkish is instead intonational prominence (a 'boundary tone' to be more exact, though the exact categorization does not seem to matter much for the formal analysis presented here).

2.2.1.2 Exclusionary criteria

In addition to the findings outlined above that seem to indicate that final prominence in Turkish is best analyzed as intonational prominence, there is evidence demonstrating that the alternative, that final prominence is foot-based (i.e. 'stress'), should be rejected outright. Final prominence in this language looks neither like trochaic nor iambic stress (bounded or unbounded).

First, it does not look iambic, because iambic languages favor left to right iterative footing (though see Everett 2003), and they are argued to always be quantity-sensitive (see e.g. Hayes 1981, 1995, Kager 1999; cf. Altshuler 2009). In fact, Hayes (1995) argues that iambic feet are inherently asymmetrical since the head is durationally enhanced compared to the non-head, making the foot quantitatively uneven (though this has been argued against, see e.g. Revithiadou & van de Vijver 1997 and van de Vijver 1998). Recall, though, that for Turkish, duration is not a good cue of final (or non-final) prominence; that is, iambs, if posited, would have to be even in this language. Further, Levi (2005) has found that, for Turkish verbs, non-final syllables are slightly longer in duration than the stressed final syllable. So, for verbs, at least, the foot would be a very strange weight-insensitive iamb of the type (HĹ), which, is indisputably unattested (see e.g. Hayes 1995). In addition, there are some (borrowed) nouns in Turkish which have inherently long vowels in penultimate position, such as *va:li* "governor." Despite the presence of the long vowel in the first syllable, regular stress falls on the final syllable. If Turkish regular stress were to be analyzed as iambic, this would, once again, constitute a weight-insensitive parse (i.e. [(va:lí)] – [(HĹ)], which, as mentioned above, is unattested for iambic languages.

A trochaic analysis of final prominence can also be rejected, for analyzing it as trochaic would require a lot of stipulations, such as having final catalexis (preventing null syllables), as in Kiparsky (1991) and Inkelas (1999), or proposing empty ON syllables for vowel-final words, as in Charette (2008). An additional problem for the trochaic analysis would be the result that there are two types of trochaic stress in the same language which have different cues: exceptional stress being cued by a sharp rise in F0 together with intensity, and final stress being cued only by a slight F0 rise that is optional.

Aside from finding no evidence for final stress as trochaic or iambic, Turkish does not show other evidence of an obligatory foot constituent either. For example, it does not place any lower limit on the size of lexical (content) words, allowing, thus, several subminimal words. Given that the well-formed foot is binary across languages (Hayes 1981, 1995), that every PWd must contain at least one foot (Selkirk 1996), and that lexical words are PWds in the unmarked case (McCarthy & Prince 1993a), one would optimally expect no subminimal words in a language that has foot structure, such as English, in which lexical words are minimally bimoraic. In Turkish, however, examples such as [su] "water," [de] "say," and [ye] "eat" are all subminimal, i.e. smaller than a binary foot,[2] despite the fact that they are all lexical words and that all can be uttered in isolation without articles, tense markers, etc.

---

[2] In fact, one does not need to focus only on CV words to find subminimal words in Turkish; since neither long vowels nor codas contribute to stress assignment in Turkish (see above), any monosyllabic lexical word, including CVC, of which there are many in Turkish, can be taken as subminimal.

2.2.2 A unified account of regular vs. exceptional stress

To summarize so far, on the current account, though the Turkish exceptional stress system is argued to be trochaic, final prominence is not a result of (trochaic) stress; rather, it is because of the effect of an intonational prominence rule, which places prominence on the final syllable of a PWd in the absence of a foot:

(4) Final Prominence: Place a boundary tone at the end of a PWd.

This rule will, then, capture all cases of regular stress/prominence in Turkish.

Pre-stressing and stressed suffixes, on the other hand, differ from regular suffixes in that they come into the computation already footed in the input, as shown in (5):

(5) a. Inputs (URs) for pre-stressing suffixes:

i. $(\text{me})_{Ft}$	ii. $(\text{de})_{Ft}$	iii. $(\text{ken})_{Ft}$	iv. $(\text{mi})_{Ft}$
NEG	too	while	question.particle

b. Inputs (URs) for stressed suffixes:

i. $(\text{ince})_{Ft}$	ii. $(\text{erek})_{Ft}$	iii. $(\text{iyor})_{Ft}$
when	by	PRES-CONT

Given these inputs, along with a rule like (6), these suffixes will be footed in the output as they are in the input.[3] That the rule refers to the right rather than left

[3] There is evidence that both edges of feet should be specified in the input (see Özçelik to appear; see also note 8). In other words, unmatched parentheses, where only the right edge of a foot is specified in the input (e.g. -me), -ince), etc.), as in Idsardi (1992), will not work. Evidence for this comes from cases where two monosyllabic exceptional suffixes are immediately adjacent (see Özçelik to appear).

edge of a foot is important here in capturing the pre-stressing behaviour of monosyllabic exceptional suffixes (more on this later).

(6) Align the right edge of a foot in the UR with the right edge of a foot in the SR.

This rule ensures that a foot edge in the input will correspond to a foot edge in the output of the grammar. No additional machinery is needed. In the spirit of earlier accounts of exceptional stress that specify a stressed *syllable* in the input and require that this correspond to a stressed syllable in the output (e.g. Alderete 1997, 2001 on Cupeño), the current account specifies *foot edges* in the input (through (5)), and requires them to correspond to foot edges in the output (through (6)).[4] Concerning the argument 'foot' versus 'syllable', however, it is not clear how earlier pre-specification accounts would be able to pre-specify a syllable in ways to make it stress the preceding syllable in Turkish (or the following syllable in languages with post-stressing suffixes such as Erkeč and Standard Bulgarian, see e.g. Avgustinova 1997, Halpern 1995, Baerman 2004), for stress cannot be prespecified on a non-existing syllable, or rather, on an adjacent syllable in a different morpheme (more on this in Section 2.4).

Let us return to the data in (2) and (3). As these data reveal, when an exceptional suffix is monosyllabic, as in (2), it is always *pre*-stressing, never

[4] I believe (6) to be universal, with the directionality condition (Left vs. Right) being parametric, which can more generally capture exceptional stress crosslinguistically, but its application is revealed only in languages where underlying foot edges are present. That is, all cases of exceptional stress in the world's languages, whether stressed, pre-stressing, or post-stressing, can likely be accounted for in this way, i.e. without specifying the location of a stressed syllable in the UR, but instead, by specifying underlying foot edges and using a rule like (6) to ensure that this information is faithfully realized in surface forms.

stressed or post-stressing. When an exceptional suffix is bisyllabic, on the other hand, it is always stressed on its first syllable, never on the second.[5] As mentioned, these data are suggestive of an analysis where Turkish stress is trochaic. That is, the parameter determining foot shape in Turkish is set to *Trochaic* (left-headed) and not to *Iambic* (right-headed):

(7) Foot shape: <u>Trochaic</u> | Iambic

Given (6) and (7), we can now capture the behaviour of *bisyllabic* exceptional suffixes in (3). It follows from (6) that, despite the fact that the Turkish grammar does not assign foot structure, these suffixes will be footed, not through a parsing rule (such as PARSE-σ that parses syllables into feet), but via faithfulness to the information specified in the UR. Further, given (7) (i.e. that the grammar is trochaic), the foot will be left-headed. This is exemplified in (8a) below (repeated from (3a)), through a comparison with a regularly stressed suffix in (8b) (repeated from (1b)):

(8) a.	UR:	/gel-(ince)/	b. /tabak-lar/
	Trochaic:	gel(ínce)	tabaklar
	SR:	[gel(ínce)]	[tabaklar]

[5] There are some additional patterns that are revealed through the interaction of different exceptional suffixes illustrated in Özçelik (2009, to appear). We will only deal with the basic data here that appeared in previous literature. See Özçelik (to appear) for a more detailed analysis (see also Note 8).

For *monosyllabic* exceptional suffixes, on the other hand, their pre-stressing behavior can be accounted for by the proposal that feet must observe binarity in Turkish, as in the vast majority of languages. That is, Foot Binarity (Ft-Bin) is set to *Yes* in Turkish:

(9) Foot Binarity: <u>Yes</u> | No

If Ft-Bin were set to *No*, these suffixes would also surface as stressed. That Ft-Bin is set to *Yes*, together with the condition that states that the right edge of an input foot must correspond to the right edge of an output foot (i.e. (6)), captures their pre-stressing behaviour. Examine (10) (repeated from (2c)).

(10)	UR:	/dinle-(me)-di/
	Align-Right:	dinle(me**)**di
	Ft-Bin:	din(leme)di
	Trochaic:	din(léme)di
	SR:	[din(léme)di]

Finally, since when more than one exceptional suffix is available in a word, it is the stress of the leftmost one that surfaces as primary (Inkelas & Orgun 1998, Inkelas 1999, Kabak & Vogel 2001), End-Rule must be set to *Left* in Turkish:[6]

[6] Most previous research does not deal with the issue of secondary stress in Turkish. The issue is not critical for the purpose of the current proposal. That main stress falls on the leftmost foot can be captured through Leftmost-Wins, too, as was done by Inkelas & Orgun (1998) instead of End-Rule-Left, if secondary stress is to be ignored. It should be noted, however, that secondary stress cannot be captured through certain accounts such as that of Kabak & Vogel (2001) and Newell (2005) (more on this in Section 2.4.2 below).

(11) End-Rule: Left | Right

Given (11), we can now capture data like (2d), too, repeated here as (12a) (see also (12b)). When there is more than one foot available, the head of the leftmost foot bears primary stress:

(12) a. din(léme)(dìde) b. an(láma)dı(làrmı)

Finally, as the data in (13) (repeated from (3b) and (3c)) indicate, closed syllables, which are potentially heavy, can be in foot-dependent position. This constitutes probable evidence that Weight-Sensitivity is set to *No*, or, at least, that it plays no role in Turkish:[7]

(13) a. ge(lérek) b. ge(líyor)

(14) Weight-Sensitivity: Yes | No

In conclusion, Turkish has binary trochees with End-Rule set to *Left*, and since, when an exceptional suffix is in word-final position, the foot is in word-final position (see e.g. (12) and (13)), Extrametricality is set to *No*:

(15) Extrametricality: Yes | No

---

[7] Remember also that if Turkish regular "stress" was analyzed as iambic, that, too, would have to be analyzed as weight-insensitive (see Section 2.2.1.2 above).

On the other hand, as mentioned earlier and assuming the parametric status of the Foot, the Turkish grammar itself cannot assign any foot structure, as is evident from the behaviour of regular final "stress" (see Section 2.2.1). Therefore, in the absence of input feet, words are not footed on the surface. This suggests, on a parametric view of the Foot, that the relevant parameter, which I will call the Footed parameter here, is set to *No* in Turkish:

(16) Footed: Yes | <u>No</u>

In sum, then, Turkish is a trochaic but footless language; it is only when an input foot is available (as in (5)) that the Turkish grammar can assign binary weight-insensitive trochees. Inputs are not specified for Trochaicity or Binarity, etc.; it is the grammar that assigns these, if an input foot is available. In the absence of input feet, Trochaicity and Binarity are vacuously satisfied.

2.2.3 Discussion

To conclude thus far, the present account captures, within a single grammar, both regular and exceptional (pre-stressing and stressed) suffixes of Turkish. Both the regular and exceptional suffixes are subject to the same parameter settings; exceptional suffixes are different only in that they are already footed in the input. Regular suffixes vacuously satisfy the parameter settings of the grammar that act on the Foot. In other words, though the grammar is trochaic and feet are binary in Turkish, these considerations become important only if there is an input foot available, for the grammar itself has no mechanism to force syllables to be parsed into feet. If footless languages exist, as is proposed here, it is normal, and expected, for a system like Turkish to exist where the grammar assigns no feet, but when a foot is available as a result of the lexical specification of a morpheme, other parameters, which are independent of the grammar's ability to *assign* foot structure, work in principled ways to place stress on the first syllable of that foot.

Finally, the current account is not without independent empirical support. The fact that there are no monosyllabic stressed exceptional suffixes in Turkish (i.e. 'stressed' despite more suffixes being added), and that stressed exceptional suffixes are always bisyllabic, and are always stressed on their first syllable (i.e. never on the second) follows directly from the current account:[8] Not only is the material that is footed in the input footed in the output, but this foot must abide by the other parameter settings of the grammar; it needs to be binary and left-headed. In a system that prespecifies the location of a stressed syllable instead of foot edges, the fact that the two hypothetical exceptional stress patterns are unattested would be left without an explanation (since any syllable could be pre-specified for stress in such a system) (more on this in Section 2.4).

---

[8] Bisyllabic exceptional suffixes can also be prestressing (e.g. aksám-leyin), as it is possible for them to be footed only on their first syllable in the input (i.e. /-$(\text{le})_{\text{Ft}}$yin/). That is, bisyllabic exceptional suffixes can either be fully footed as in the examples in (5b) (i.e. /$(\sigma.\sigma)_{\text{Ft}}$/), footed on their first syllable only (i.e. /$(\sigma)_{\text{Ft}}\sigma$/), or footed on their second syllable only (i.e. /$\sigma(\sigma)_{\text{Ft}}$/), whereas monosyllabic exceptional suffixes have only one option, to be footed on the single syllable available, as with the examples in (5a) above, i.e. /$(\sigma)_{\text{Ft}}$/. That is, every option that should exist under the current account is actually attested, and all these are captured through the same grammar. The difference between bisyllabic exceptional suffixes that are fully footed vs. bisyllabic exceptional suffixes footed only on their second syllable is, of course, difficult to tell, since, under either option, the first syllable of a bisyllabic exceptional suffix will normally be stressed, given the parameter settings outlined in this chapter, though see Özçelik (to appear), where the difference is revealed through cases in which a bisyllabic exceptional suffix and a monosyllabic exceptional suffix are immediately adjacent. What is important to note is that the prosodic grammar of Turkish proposed here takes into account the set of *all* possible inputs, in terms of footing options, and gives, as output, only those that can actually be uttered in Turkish, and filters out those that cannot, such as monosyllabic exceptional suffixes that are stressed and bisyllabic exceptional suffixes that are stressed on their second syllable.

The current approach to exceptionality avoids, for this reason, one of the most common criticisms directed against pre-specification: Unlike other pre-specification accounts in the literature which have come under attack for having too much information specified in the underlying representation (see e.g. Mester & Itô 1989 and Steriade 1995), on the current account, certain predictions can actually be made about which forms occur (or do not occur) in a given language since URs are not completely adjusted to fit the observed data (see also note 8). We will see, in Section 2.4, that this is, in fact, a problem for previous accounts of Turkish stress. Before that, we present one final type of evidence for the footless analysis of Turkish regular "stress", this time from higher-level prosody.

2.3 Evidence from higher-level prosody

I have argued above that regular "stress" in Turkish does not involve foot structure whereas exceptional stress is a result of the proposal that certain morphemes are footed in the input and that the input foot is preserved in the output. A number of observations were presented above in support of this proposal. There is, in addition, some evidence supporting this proposal that comes from higher-level prosody in Turkish (Özçelik 2011).

We start with some background on higher-level prosody. Prosodic constituents are typically assumed to be organized into a hierarchy. In the case of higher-level constituents, PWds are organized into phonological phrases (PPhs), and PPhs into intonational phrases (I-phrases). As with lower-level prosodic constituents, such as the Foot, each higher-level constituent has a head, either the rightmost constituent it dominates, or the leftmost, and the head is more prominent than the dependent. For example, the head of a PPh is either the rightmost or the leftmost PWd depending on the language, and the head bears the PPh-level stress, and is, thus, more prominent than the non-head.

In the case of Turkish, PPh-level stress falls on the leftmost PWd in a PPh (Kabak & Vogel 2001, Özçelik & Nagai 2011), indicated in boldface in (17):

(17) a. [**o** adam]$_{PPh}$	b. [**sarhoş** dilbilimci]$_{PPh}$	c. [**şişman** prenses]$_{PPh}$
that man	drunk linguist	fat princess
"that man"	"drunk linguist"	"fat princess"

The head of an I-phrase in Turkish is the rightmost PPh (Özçelik 2010, Özçelik & Nagai 2010, 2011), the head of which is underlined in the following examples:

(18) a. [[**o**]$_{PPh}$ [**adam**]$_{PPh}$]$_{I}$	b. [[**sarhoş** dilbilimci]$_{PPh}$ [**tez** yaz-dı]$_{PPh}$]$_{I}$
that man	drunk linguist thesis write-PAST
"That is a man."	"The drunk linguist wrote a thesis."

That is, sentential stress, in Turkish, falls on the leftmost PWd in the rightmost PPh within the I-phrase.

In sentences such as (19a), where the subject *adam* "a man" stays in SpecVP in syntax (i.e. under the same VP projection as the verb), there is only one PPh, and *adam*, the first PWd in the PPh, bears PPh-level prominence; since this is the only PPh within I (and thus the rightmost one), this word also receives I-level prominence. In a sentence like (19b), on the other hand, there are two PPhs, since the definite subject, *adam* here, moves out of *v*P/VP up to SpecTP. Out of the two PPhs, the latter bears I-level prominence, for it is rightmost in I (Özçelik & Nagai 2010, 2011).

(19) a. [[**<u>Adám</u>** gel-dí]$_{PPh}$]$_{I}$ man arrive-PAST "A man arrived."

b. [[**Adám**]$_{PPh}$ [**<u>gel-dí</u>**]$_{PPh}$]$_{I}$ man arrive-PAST "The man arrived."

Crucially, however, when an exceptional suffix is present in the second word, as in (20), the dichotomy observed between (19a) and (19b) is lost, and the only footed word available, i.e. *(gél.<u>me</u>)di*, gets stressed, irrespective of whether the subject is definite or indefinite (Özçelik 2011). That is, when a foot is available, it attracts PPh- and I-level prominence (heading both the PPh and I), which is not crosslinguistically unusual (see e.g. Gussenhoven 2007).

(20) a. Adám **<u>gél-me-di</u>** man arrive-NEG-PAST "A man didn't arrive."

b. Adám **<u>gél-me-di</u>** man arrive-NEG-PAST "The man didn't arrive."

a'. ***<u>Adám</u>** gél-me-di

Note that if there *was* indeed foot structure on *adam*, we would expect, under the indefinite reading of (20), this word to get PPh- and I-level prominence, as in (20a'). Another example is given below, this time with a different exceptional suffix, -*mi*:

(21) a. Adám **<u>gel-dí-mi</u>** man arrive-PAST-Q "Did a man arrive?"

b. Adám **<u>gel-dí-mi</u>** man arrive-PAST-Q "Did the man arrive?"

a'. ***<u>Adám</u>** gel-dí-mi

In sum, these facts show, once again, that only exceptional stress involves foot structure in Turkish, whereas so-called regular stress is nothing more than optional intonational prominence.

2.4 Comparison with previous accounts

A few words must be said in comparing the current proposal with previous accounts of Turkish stress. Several different approaches have been taken in the literature. Regular final stress, for example, has been analyzed in terms of unbounded right-headed feet (Kaisse 1986, Halle & Vergnaud 1987), bounded right-to-left iambic feet (Barker 1989), a final binary trochee with catalexis (Kiparsky 1991, Inkelas 1999), or a system where stress simply falls on the last syllable of a PWd without any reference to the presence or absence of a foot (Hayes 1991, van der Hulst 1999, Kabak & Vogel 2001).

Clearly, one reason why so many different options have been proposed for final stress is the observation that Turkish does not have regular secondary stress, meaning that there is little, if any, evidence as to what exactly final stress/prominence is. This makes the analysis of exceptional stress even more interesting, for it has implications for the correct analysis of regular/final stress, too.

Among researchers working on Turkish stress, exceptional stress of the first type, i.e. the so-called pre-stressing forms in (2), has particularly been of interest, though some researchers have dealt with stressed exceptional suffixes, i.e. those in (3), as well. Below, I overview two of the most recent accounts, and the problems they have in view of the discussion provided above, and in so doing, I compare them to the current account.

2.4.1 Cophonologies account

Working in a cophonologies approach, Inkelas (1999) and Inkelas & Orgun (1998, 2003) analyze pre-stressing suffixes as having a trochaic foot structure underlyingly that is wider than the suffixes themselves and thus includes one syllable to their left. For example, their input for the pre-stressing suffix *–me* is as in (22a). Notice that the head of the foot is empty:

(22a)	(*	)
	σ	σ
	∅	me

When *–me* is attached to a stem like *gel* “come,” the output will be as follows:

(22b)	(*	)
	σ	σ
	gél	me

Inkelas & Orgun similarly analyze stressed exceptional suffixes, which are all bisyllabic, as pre-specified for a trochaic foot, but this time, the head of the foot is specified, as follows, as opposed to in (22a):

(23)	(*	)
	σ	σ
	in	ce

That is, they provide a unified account that nicely captures the trochaic nature of both types of these suffixes. In fact, they are the first in the literature to notice the trochaicity of Turkish exceptional stress.

On the other hand, Inkelas & Orgun argue that suffixes that are regularly stressed belong to a completely different cophonology, which imposes a pattern of fixed word final stress. They suggest that stress in this cophonology, unlike in the cophonologies targeting pre-stressing and stressed exceptional suffixes, can be generated in a variety of different ways, such as through a right-headed unbounded foot, a final binary iambic foot, a final grid mark, or a final binary trochee + catalexis. In sum, each suffix in the language, on their account, needs to be assigned to a different component of the grammar, depending on whether they are pre-stressing, exceptionally stressed, or regularly stressed. In short, there are multiple grammars (e.g. trochaic and iambic), each targeting different suffixes.

The current account is similar to that of Inkelas & Orgun in that exceptional suffixes, whether pre-stressing or stressed, surface within trochees. It differs from their account in significant ways though. It is the general Turkish grammar that yields trochaic footing on the current account; the inputs are not and do not need to be pre-specified as trochees. This provides advantages over Inkelas & Orgun's account on both conceptual and empirical levels. On a conceptual level, the current account offers a single grammar that targets both exceptional and regular suffixes. In other words, all suffixes, on our account, are subject to the same parameter settings given in Section 2.2.2 above; it is not the case that some suffixes are trochaic and some iambic, for instance. Only foot edges are pre-specified: Exceptional suffixes come into the computation already footed, whereas regular suffixes do not, which is the only difference between the two.

Another way the two accounts differ at the conceptual level is that, in the case of monosyllabic exceptional suffixes, Inkelas & Orgun's account posits underlying feet whose head is not specified, yet the dependent is, which is unexpected, for dependents, whether they are phonological or syntactic, are by their very nature, dependent on heads. Heads, by definition, can occur alone. Specifying heads only, on Inkelas & Orgun's account, would, however, predict monosyllabic exceptional suffixes that are stressed. It becomes a mystery, in other words, why monosyllabic exceptional suffixes are prestressing, in the absence of being able to prespecify the single syllable available as the dependent constituent of a foot. On the current account, on the other hand, these syllables are not specified as the head or dependent: Only the foot edges are specified; heads are assigned by the grammar (see (7)). Further, the application of Align-Right (see (6)) and Foot-Binarity (see (9)) ensure that material that is located at the right edge of a foot in the input is located at the right edge of a (binary) foot on the surface, the edge that corresponds to the dependent syllable given that the grammar is trochaic. In other words, at no point in the derivation does the current account need to posit dependents without heads.

The two accounts differ on an empirical level, too: Unlike the Inkelas & Orgun account, certain unattested patterns are accounted for on the current account. That only the edges of feet are pre-specified in the input, and that the grammar takes care of the rest (e.g. binarity and trochaicity) ensures that, on the current account, no matter how diverse input forms are, there will be no exceptionally stressed monosyllabic suffixes on the surface (i.e. stressed despite more affixes being added to their right, e.g. *gel-<u>mé</u>-di-ler), as well as no bisyllabic suffixes that are stressed on their second syllable, e.g. *gel-<u>incé</u>. In contrast, on Inkelas & Orgun's account, only certain forms are allowed to occur in the input, such as (22a) and (23). It is not clear, however, why a form like the mirror image of (22a), such as (24) below, or a form like (25) (compare with

(23)), should not occur. In other words, if affixes can be specified to be in the non-head position of a trochaic foot, why can they not be specified to be in the head position as well? Or if a foot can be specified on an affix so as to have a syllable at the left edge whose segments are not specified, why can the same not apply at the right edge? Unless this is captured through the grammar (which Inkelas & Orgun opt not to do), it does not seem possible to explain such a gap based on the lexicon; that is, forms such as (24) and (25) should also exist, thereby resulting in monosyllabic exceptional suffixes that are stressed and bisyllabic exceptional suffixes that are stressed on the second syllable, both of which are unattested in Turkish.

(24) (*　　)　　Ex: no such patterns as *gel-<u>mé</u>-di-ler
σ　σ
<u>me</u>　∅

(25) (*　　)　　Ex: no such patters as *gel-<u>incé</u>
σ σ　σ
<u>in.ce</u>　∅

In sum, we have seen, in this section, that Inkelas & Orgun's account has a number of conceptual and empirical problems. Nevertheless, it is important to emphasize that it was the first account of Turkish stress that truly captured the trochaic spirit of the language, and that provided a unified analysis of pre-stressing and stressed exceptional suffixes. Without Inkelas & Orgun's pioneering work, the current work might not have been possible.

2.4.2 PWd adjunction account

More recently, Kabak & Vogel (2001) analyze pre-stressing suffixes as "prosodic word adjoiners" (PWAs), which, unlike regular affixes, cannot attach inside the PWd, and must therefore adjoin to it. And since, on their account, regular stress is assigned to the final syllable of the PWd, exceptional stress is nothing other than regular stress followed by a PWA:

(26) [[gél]$_{\text{PWd}}$ - <u>me</u> $_{\text{(PWA)}}$]

come-not

'Don't come.'

This proposal presents a unified analysis of regular and exceptional (pre-stressing) suffixes.[9] There are, however, several problems with it. First, though the unified account effectively allows for one grammar, the fact that the proposal treats exceptional stress exactly the same as regular stress is problematic in that the two

---

[9] Newell (2005) follows on Kabak & Vogel in that a domain-based explanation is proposed, but she expands on this in that exceptional forms are claimed to constitute a morpho-syntactic class, each falling outside of a spell-out domain, in that they either sit in vP or CP. As with Kabak & Vogel (2001), Newell's account offers a unified analysis of regular and pre-stressing suffixes, but faces the same issues as Kabak & Vogel (2001), as will be explained in this section. In addition, Newell only looks at a *subclass* of these affixes (those that attach to verbs) and only when they are in certain contexts (when they attach to verbs only or when they attach to sentences only) though they can actually appear in almost any syntactic position; that is, many pre-stressing suffixes that can attach to a verb can also attach to a noun or an adjective, etc., which is missed by all syntactic analyses. One example would be the behavior of the pre-stressing suffix *-de*. Though it is true, as Newell suggests, that *-de* can attach to verbs, connect sentences, and perhaps head a CP projection (and thus sit above the clause) (p. 52), it can also appear in examples like [bén-de], "me too," or in a sentence like [[bén-de] [gel-dí-m]] (I-too-arrive-PAST-1$^{\text{st}}$.sing), meaning "I - in addition to X - also arrived," where it is evident that *-de* does not sit above the clause or does not attach to a CP, VP, or IP projection. That is, morpho-syntax cannot be the force behind exceptionality. The issue seems to be clearly phonological, and one that requires pre-specification of one type or another. Further, a morpho-syntactic approach would be unable to account for the unified behavior of pre-stressing and stressed exceptional suffixes, for the latter are stressed, and cannot, thus, be outside of a spell-out domain.

have completely different phonetic cues. As mentioned in Section 2.2.1.1, exceptional stress is cued by a sharp F0 rise and intensity, while final prominence is only cued by a slight optional F0 rise.

Second, since stress assignment occurs within the PWd, and pre-stressing suffixes are proposed by Kabak & Vogel to be outside this domain, no stress is expected after the syllable preceding the leftmost pre-stressing suffix (i.e. their PWAs), for the leftmost pre-stressing suffix closes off the PWd, and thereby falls outside of the domain in which stress is assigned, along with any syllables that follow it. This is problematic because no secondary stress is predicted after the leftmost PWA, which is not what is observed, as can be seen in words containing more than one exceptional suffix as illustrated in (27) (adjusted from (2d)):

(27) [[dinlé]$_{\text{PWd}}$-me$_{\text{(PWA)}}$-dì-de$_{\text{(PWA)}}$]
listen NEG PAST also
'He did not listen, either.'

On Kabak & Vogel's account, which views the whole chunk *–me-di-de* as outside the domain of the PWd, there is no way of capturing secondary stress. Rather, their analysis predicts no stress, primary or secondary, after the first pre-stressing suffix.

Third, Kabak & Vogel argue, in an effort to account for stressed exceptional suffixes, too, that these suffixes (which are all bisyllabic as mentioned above) should, unlike pre-stressing suffixes, be captured by pre-specifying them for the exact location of stress. This is problematic for several reasons: First of all, this would add additional machinery (see also Inkelas & Orgun 2003), for pre-stressing and stressed exceptional suffixes, on such an account, would be treated differently, and crucially, despite the fact that there is good evidence for the two types of affixes to be treated in a unified manner, as both seem to be trochaic (see above). Second, and more importantly, such a pre-specification account would predict, as with the Inkelas & Orgun account covered above, that there exist bisyllabic exceptional suffixes in Turkish that always bear stress on their second syllable, as well as monosyllabic exceptional suffixes that are stressed: If one can pre-specify bisyllabic suffixes to be stressed on their first syllable, the same should, after all, apply to (at least some) monosyllabic suffixes, too. Similarly, there should be some bisyllabic exceptional suffixes that are stressed on their second syllable. As mentioned above, however, no such forms are attested in Turkish. No explanations are offered, on Kabak & Vogel's account, for these gaps. That is, there is no principled reason, on such an account, as to why only the initial syllable of a bisyllabic suffix should (or can) be pre-specified. On our account, on the other hand, not only does an explanation of the gaps follow straightforwardly from the edge-marked inputs, but also the attested inventory is exactly the one that is predicted.

Note that it is a must, on Kabak & Vogel's account, to refer to pre-specification in accounting for the behaviour of stressed exceptional suffixes, for they are stressed, and cannot, therefore, be treated in the same way as pre-stressing exceptional suffixes on their account, since stressed syllables cannot possibly be argued to be outside of the PWd, as they would, then, not surface as stressed. And since simply prespecifying the location of a stressed syllable will be unable to address the above-mentioned gaps in the language, it seems more promising to pre-specify foot edges and let the grammar do the rest, as on the current account. But once this is done for bisyllabic exceptional suffixes, one might question the motivation for treating monosyllabic exceptional suffixes differently, e.g. by arguing that they are PWAs, which, in fact, is another way of indicating pre-specification, i.e. in that the relevant suffixes are morphologically specified to be outside of a PWd.

Finally, there seems to be no independent motivation for the PWd-adjunction analysis. In fact, other phonological processes such as vowel harmony are not sensitive to the PWd boundaries that Kabak & Vogel posit, which they acknowledge. For example, all suffixes, in a word like (27) above are harmonized to the root-final vowel, even though they are all claimed, by Kabak & Vogel, to be outside of the PWd of the root. This is despite the fact that there is other evidence that the domain of vowel harmony in Turkish is the PWd, and is not, for example, the phonological phrase (PPh): As Kabak & Vogel also note, the second member of a compound or an adj + noun sequence, such as (28), does not harmonize with the first member:

(28) $[\text{yesil}]_{\text{PWd}}$ $[\text{araba}]_{\text{PWd}}$

green car

"green car"

The presence of vowel harmony in (27), as opposed to (28), seems to indicate, then, that all suffixes in (27), including those that are pre-stressing, are *within* the PWd (see also Goad & White 2009).

In sum, what is appealing about the Kabak & Vogel (2001) account is that it treats regular and pre-stressing suffixes in a unified manner, and avoids positing multiple grammars. In doing so, much of the Turkish vocabulary is covered in an economical way. However, it faces several problems such as not being able to predict the presence of certain data, as well as overpredicting in the case of other data. Further, stressed exceptional suffixes are treated in a different way from prestressing exceptional suffixes, despite the presence of data strongly favouring a unified treatment of the two. All in all, then, the edge-based pre-specification account proposed here seems to better capture what is present and what is not present in the Turkish data than the Kabak & Vogel account, and it does so in ways that seem to be more economical.

In this chapter, we have established that Turkish, the target language of the learners to be tested in this thesis, does not assign foot structure (unless a foot is available in the UR of a morpheme). In Chapter 3, we turn to examine the stress systems of the two languages which are the mother tongues of our learners, French and English, as well as some puzzling data from first language acquisition. We first consider French, another language that is argued here to be footless, though evidence in favour of a footless analysis in this language is not as clear as it is for Turkish, for French, unlike Turkish, has no exceptional stress. Nevertheless, there is some evidence for a footless analysis of French, which will be considered in the first section of the chapter. The status of English, an indisputably footed language, will also be considered in the same chapter. All parameter settings will be examined, which will later be relevant in view of the acquisition path that is proposed in Chapter 4 of the thesis.

Chapter 3: Stress in the native languages: French and English

In Chapter 2, I have argued, contra much previous research, that the Foot is not a universal constituent of the Prosodic Hierarchy, but that its presence/absence is parametrically determined; whereas some languages require every prosodic word (PWd) to have at least one foot, other languages, such as Turkish, are footless. In this chapter, I consider French and English, the native languages of the two learner populations to be tested in this thesis. I first argue that French, as with Turkish, does not assign foot structure. I present evidence for this drawing on previous literature on French. English, on the other hand, is indisputably footed, as has been argued by perhaps all previous research on English stress; the sections on English, therefore, serve to provide the appropriate settings of all major parameters that act on the Foot, rather than questioning the presence or absence of this constituent in this language.

The chapter is organized in the following way. The first two sections, Sections 3.1 and 3.2, present a formal account of the lower-level prosody in French and English respectively. Section 3.3, then, presents additional evidence for the parametric status of the Foot from the literature on first language (L1) acquisition and bilingualism. Finally, Section 3.4 concludes the chapter.

3.1 French stress

In the previous chapter, it was argued that the so-called regular final stress in Turkish is not foot-based, that is, that Turkish does not require words to have feet. If this proposal can be motivated more generally, this opens the way for analyzing

French and other fixed stress languages as footless. For Turkish, some of the best evidence in favour of a footless analysis came from a comparison of regular vs. exceptional stress. French, unlike Turkish, has no exceptional stress. On the face of it, for languages like French, which only has regular "stress," positing a right-aligned foot or an unbounded foot versus having no foot structure at all will have similar predictions in terms of where main prominence falls. However, several issues suggest that French is footless, such as the fact that the domain of obligatory stress assignment in the language is the PPh (not the PWd) (Delattre 1966, Dell 1984, Jun & Fougeron 2000), and that French has many subminimal CV words.

In fact, French prominence has already been proposed to be intonational, as was argued for regular stress/prominence in Turkish in Chapter 2 (see e.g. Verluyten 1982, Mertens 1987, Jun & Fougeron 2000, Féry 2001), though the issue of whether or not this means that French has no foot structure has, to my knowledge, only explicitly been addressed, by comparing the two positions, by Goad and colleagues (Goad & Buckley 2006; Goad & Prévost 2008, 2011). The authors reach the conclusion that French does have foot structure; this conclusion is based on some evidence *for* the Foot in this language, along with some that is against it (more on this below), as well as partially on the assumption that analyzing French as a footless language would require a marked prosodic hierarchy different from other languages (Selkirk 1996), especially within the context of their interpretation of the data they examine from child French (see Section 3.2.2) which is inconsistent with a footless analysis. If Turkish is footless, however, as argued in the previous chapter, French would not be alone in requiring a footless grammar.

The remainder of this section is organized as follows: Section 3.1.1 outlines the generally accepted facts of the French prominence system from different viewpoints without delving much into the issue of whether French has foot structure or not. Section 3.1.2, then, presents several facts, grouped under four categories, supporting the argument that French prominence is indeed footless. Section 3.1.3, then, illustrates the challenges for such an approach in French based on some evidence *for* the Foot in this language. It is, nevertheless, concluded that, when all evidence is considered, there is good reason to assume French to be a footless language like Turkish. Finally, Section 3.1.4 widens the cross-linguistic perspective, and by drawing upon the arguments presented for French, as well as Turkish (Chapter 2), argues for the presence of other footless languages.

3.1.1 Overview of the facts

Researchers working on French prominence generally concur that there are two types of prominence in this language, final accent and emphatic accent (e.g. Grammont 1933, Delattre 1966, Malmberg 1969, Léon 1972, Martin 1975, 1980, Rossi 1980, Dell 1984, Mertens 1990 and Post 2000). Note that the usage of the term "emphatic" is traditional here, and though the term implies otherwise, emphatic stress is not limited to emphatic expressions (Jun & Fougeron 2000, Féry 2001; cf. Montreuil 2002):

(1) a. Final accent: The last syllable of a phonological phrase (PPh) is stressed.

b. Emphatic accent: The first syllable or the first onset-initial syllable of a PPh is stressed, including, according to Montreuil (2002) and Féry (2001), function words.[1]

The two types of prominence are illustrated below in (2) and (3) respectively. Stressed syllables are capitalized.

(2) Le fils du direc*TEUR* a vu le prési*DENT* (Di Cristo 1998: 203)

"The manager's son has seen the president"

(3) a. *EX*traordinaire b. ex*TRA*ordinaire c. *extraORdinaire (Féry 2001)

'extraordinary'

In terms of its acoustic correlates, syllables with final accent are accompanied by a slight F0 rise and much longer duration, as well as weaker intensity, than unaccented syllables (Wioland 1991, Montreuil 2002). Syllables with emphatic accent, on the other hand, have an abrupt F0 rise (Wioland 1991, Jun & Fougeron 2000, Féry 2001, Montreuil 2002), and also, according to some researchers, greater intensity and slightly longer duration than their unaccented counterparts (Wioland 1991, Montreuil 2002).

[1] There is some disagreement on this; some researchers argue that function words typically do not receive an initial high accent (see e.g. Jun & Fougeron 2000).

Most of the literature has focused on final accent, as it is usually agreed to be the only obligatory position of prominence in French. This prominence has been analyzed by some researchers as a pitch-accent associated with a PPh-final stressed syllable (without any recourse to the presence/absence of foot structure) (e.g. Dell 1984, Jun & Fougeron, 2000,[2] Post 2000). Others have argued that it is a boundary tone, associated with the final syllable of a PPh (e.g. Rossi 1980, Vaissière 1983, Martin 1987, Féry 2001), the implication of which is that it involves neither stress nor foot structure. Among researchers maintaining that it refers to stress, it has been analyzed as the head of an iambic foot (Charette 1991, Scullen 1997, Armstrong 1999, Goad & Buckley 2006, Goad & Prévost 2011) or, less commonly, of a trochaic foot (Selkirk 1978, Montreuil 2002).

Other researchers have incorporated final and initial accent into a tonal pattern. Analyzing French accent as intonational prominence, Jun & Fougeron (2000) argue for an underlying tonal pattern of /LHiLH*/ for the PPh (or rather Accentual Phrase (AP), as they word it).[3] On this proposal, the final H tone, denoted as H*, represents primary accent; it has a demarcative function, and is associated with the final full vowel in the PPh. The initial H tone, represented as Hi, is optional, and is usually associated with the first *or* second syllable of the first content word within the PPh, Jun & Fougeron report, based on an experiment they conducted with three speakers and on the findings of previous literature (e.g.

---

[2] Jun & Fougeron have a prosodic hierarchy that does not involve the Foot above the Syllable. Given this, and given their statement that they assume that prosodic organization obeys the Strict Layer Hypothesis (p. 210), it follows that they assume French to be a footless language, though they do not explicitly state that French lacks foot structure.
[3] Jun & Fougeron (2000) focus on European French, but given Thibault & Ouellet (1996), their proposal seems to apply to Québec French, too (Goad & Prévost 2011). As will be mentioned later in Chapter 5, French-speaking learners of Turkish tested in this thesis include native speakers of both European and Québec French.

Vaissière 1974, 1997, Fonagy 1980). They also note, based on the same experiment, that the first Hi is not only optional and variable in terms of its location, but it sometimes surfaces as an H plateau on the first two or three syllables.

As for the L tones, the first one usually occurs on the syllable immediately before the Hi, and, therefore, typically falls on the first syllable of a PPh, unless the Hi is realized on that syllable, in which case the initial L is not always realized. The second L is realized on the syllable immediately before the H*, thus falling on the penultimate syllable in the PPh. Finally, the initial Hi is sensitive to the presence of functional material (despite sometimes being realized on function words, too), and the initial L, thus, usually falls on function words, when such words are present.

The following example illustrates this LHiLH* pattern:

(4) Le désagréable garçon ment à sa mere (Jun & Fougeron 2000: 215)

[L Hi L H*]$_{PPh}$

"The unpleasant boy lies to his mother."

According to Fonagy (1980) and Jun & Fougeron (2000), the realization of the initial H depends on a number of factors such as rhythm, style and speaker. Other authors disagree, arguing that any claims for secondary accent are "severely misguided," and that initial accent is limited to emphatic situations (Montreuil 2002). According to Féry (2001), outside of emphatic situations, initial accent is mostly heard in the speech of public persons such as politicians and news reporters.

In conclusion, French accent seems to be PPh-final, with an optional, secondary H tone on the first or the second syllable of the first PWd of the PPh (although it can appear on function words, too), though the conditions under which it appears, aside from emphatic situations, are debated. Final prominence seems to be less disputed, but its obligatory status has also been challenged, as will be explained below in more detail.

Given these facts, the following section will present four different types of evidence for a footless analysis of French. The first comes mostly from Féry (2001), who concludes that final prominence in French is a boundary tone, rather than stress, though she does not mention the implications of this with respect to the presence/absence of foot structure in the language, as with most other researchers working on French prominence. The latter three come directly from Goad & Prévost (2011), who compare evidence for and against the Foot in French and provide reasons why a foot-based analysis of French is problematic.

3.1.2 Evidence for a footless analysis of French

3.1.2.1 Optionality and variability

One of the best types of evidence for a footless analysis of French comes from the fact that, as mentioned above, French accent shows some optional and variable behavior. The situation with the initial accent has already been detailed above; it is optional in that it can be present or absent and it is variable in that it can appear on either the first or second syllable of a PPh (though some of this variability is apparently due to the presence of function words). Some researchers have, in addition, shown that final accent is optional and variable. Féry (2001), for example, experimentally demonstrates, based on recorded naturalistic data, that final accent is not obligatory and, when present, variably placed. She emphasizes, accordingly, that in a sentence like (5), an H tone can be placed on *à*, *son*, or on the first or second syllable of the last PWd *bébé*, and that sometimes just an L tone is placed on the final syllable.

(5) Elle donne le biberon à son bébé.   (Féry 2001)

"She gives the bottle to her baby"

Given this optional and variable behavior, prominence in French does not look like stress or pitch-accent of the type that is associated with stressed syllables, where the location of stress is rule-governed, and variable behavior such as this is not expected, as Féry also notes. As mentioned in Chapter 2, such optionality is not expected in stress languages (Hualde et al. 2002, Hyman 2006).

Féry illustrates, in addition, that sometimes a PPh can bear an initial high tone only, with no final tone, and, in such cases, the tone can even be associated with a function word, including one with a schwa, as illustrated below:

(6) ...quel est le premier thème scientifique de votre premier livre [DE science fiction]

"what is the first scientific theme that you have chosen in your first science-fiction book"

Given that even a schwa can bear this high tone, even though schwa is typically considered to be unstressable in French, together with the variability as to which syllable bears the high tone, Féry concludes that it must be a boundary tone, not a pitch-accent.

Let us now return to initial/emphatic accent. As mentioned in Section 3.1.1, the conditions under which initial accent appears are debatable. Two aspects of this accent, however, seem to be well-established, and illustrate situations not expected in stress languages: One, its presence depends on speaker style (e.g. Fonagy 1980, Jun & Fougeron 2000, Féry 2001). Two, whether the PPh starts with an onset or not influences the location of accent; usually the first onset-initial syllable of a PPh bears initial accent (Tranel 1987, Vassière 1997, Montreuil 2002), though initial onsetless syllables can also bear it (Féry 2001). Such behavior is exceptionally unusual in stress languages; it is accepted by almost all research on stress that onsets do not contribute to stress assignment in languages of the world (see e.g. Hayes 1981, 1995, and Halle & Vergnaud 1987 on the issue; cf. Davis 1988).

Finally, as is noted by Jun & Fougeron (2000), the initial H tone can sometimes appear on a sequence of adjacent syllables (see above), creating a plateau. This type of tonal interpolation is unusual in stress languages. In fact, when syllables are 'stressed', this means that they are more prominent than adjacent syllables. In other words, in stress languages, stressed syllables can bear high pitch, but adjacent syllables should be lower in pitch.

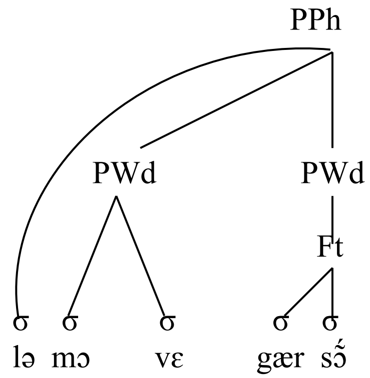
Given all this, French prominence looks like a sequence of boundary tones, with some optional and variable behavior (especially with respect to initial accent). Not surprisingly, then, researchers working on the typology of prominence systems, such as Beckman (1986) and Ladd (1996), have concluded that French does not have any stress at all, but only cues that demarcate the edges of prosodic constituents.

The seemingly obligatory final accent in French, therefore, seems to be the same phenomenon in nature as Turkish regular final "stress," in that they are both boundary tones, except that the domain of this tone is the PPh in French as opposed to the PWd in Turkish. That the PPh is the domain of prominence in French is yet another reason for analyzing French as footless, which is the topic of the following section.

3.1.2.2 Domain of prominence

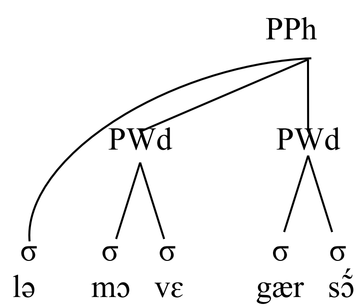
Perhaps the best evidence for a footless analysis of French comes from the fact that, as mentioned above, the domain of prominence is the PPh in French. As Goad & Prévost (2011) note, this suggests that, even if this PPh-final prominence is considered to be "stress," (and "obligatory," contra e.g. Féry 2001), words that are not in PPh-final position can have no stress/prominence, and thus, no foot (though see below). That is, when the optional nonfinal Hi mentioned by Jun & Fougeron (2000) does not surface, only the final word in the PPh receives prominence. Even if final prominence were analyzed as stress, the fact that the rest of the words within the PPh can occur without any type of prominence is evidence, by itself, that French words do not have to have foot structure. That there is only one word with obligatory prominence within the PPh suggests a representation as follows, if one takes final prominence to be foot-based (Goad & Prévost 2011):

(7)



Goad & Prévost (2011) argue against this structure, because it violates Headedness, the principle that requires every constituent to dominate at least one constituent that is below it in the Prosodic Hierarchy.[4] But if the presence/absence of the Foot is parametric, as we have argued in Chapter 2, and if the prosodic structure for French has no Foot, then a structure like (8) will not violate Headedness. Headedness at the Foot level will be satisfied vacuously if there is no foot in the language. That is, if French prominence is indeed intonational (e.g. a boundary tone), the structure would be as in (8).[5]

(8)



[4] Goad & Prévost propose, instead, that every PWd has a foot. Not every foot has phonetic correlates, because they impose Jun & Fougeron's (2000) LHiLH* tonal pattern on top of foot structure, and only foot heads that align with a high tone are phonetically realized. They argue that the initial foot is trochaic, because Hi is typically aligned with the left edge of the first PWd in a PPh (see Section 3.1.1), thus often skipping functional material. The final foot is iambic, because H* is typically aligned with the right edge of the final PWd in a PPh.

[5] An alternative, argued for by Jun & Fougeron (2000), is a structure that does not have a PWd constituent, either.

3.1.2.3 Word minimality

Every lexical word is, in the unmarked case, a PWd (McCarthy & Prince 1993a), and every PWd must contain at least one foot (McCarthy & Prince 1986) in order to satisfy Headedness (Selkirk 1996). Given that the well-formed foot is binary across languages (Hayes 1981, 1995), there is a minimum size requirement on lexical words in many languages; namely, every lexical word should minimally contain one binary foot, one that is either bisyllabic or bimoraic. Several languages where there is considerable evidence for foot structure, thus, have no subminimal words, words composed of a single syllable or mora. For example, in Mohawk, a language with weight-insensitive trochees (Piggott 1995), content words must have at least two syllables (Michelson 1988). In English, a language with moraic trochees (see below), every word contains at least two moras. If a language has foot structure, then, it should *ideally* not have words smaller than two moras (though there are exceptions, e.g. Spanish, see Goad to appear).

Words composed of an open syllable with a short vowel are indisputably monomoraic, and monomoraic words are indisputably subminimal, irrespective of the other properties of a language. If French has many words of this type, this, as Goad & Prévost (2011) point out, could be because French, unlike English, has no feet, and therefore, places no limits on the lower bound of word size.

This prediction is, in fact, borne out. French has many subminimal (lexical) words composed of a single short vowel (examples from Goad & Prévost 2011):[6]

[6] What counts as a short vowel varies across researchers. However, oral vowels in word-final open syllables are generally viewed to be short, even when this violates word minimality, as with the examples in (9) (see e.g. Walker 1984, Montreuil 1995, Goad & Prévost 2011; cf. Scullen 1997).

(9) a. [lɛ] *lait* b. [ʃa] *chat* c. [li] *lit* d. [ne] *nez* e. [ʒy] *jus*
"milk" "cat" "bed" "nose" "juice"

It seems, therefore, that foot binarity is not respected in French. This would not be unexpected if French has no feet.[7]

3.1.2.4 Different from a typical Iamb (or Trochee)

French final prominence, if it were to be foot-based, would have to be iambic, given that it is final. The alternative, positing trochees,[8] would require final degenerate feet in words ending in CV syllables, which, as Goad & Prévost (2011) point out, would violate Hayes' (1995) Priority Clause: Degenerate feet would surface at the edge where foot construction begins (e.g. [mɔ(vɛ́)]); satisfying the Priority Clause with trochees would, however, lead to incorrect stress location: *[(mɔ́vɛ)] (but see below).

Analyzing French as iambic, on the other hand, comes with its own problems, as discussed by Goad & Prévost: The typical iambic system is one where feet are (i) quantity-sensitive (and optimally uneven), (ii) iterative, and (iii) constructed from left-to-right, out of which the first, quantity-sensitivity, is often regarded as a universal requirement for iambic systems; no quantity-insensitive

[7] Note, however, that this is not an empirical claim; footed languages that allow degenerate feet are, of course, expected to permit lexical words that are subminimal. That is, the fact that French has many subminimal words adds to the possibility that it is footless, but does not, by itself, constitute evidence that it is a footless language.

[8] Selkirk (1978) proposes a trochaic account of French stress where every syllable, except for ones that contain schwa, forms a foot of its own. That is, all feet are monosyllabic and are composed only of a head on her account, except when a schwa is available, in which case schwa occurs in the dependent position of a bisyllabic foot. This account has the advantage of capturing schwa deletion, which does not occur when there are two consecutive schwas (though see Scheer (2011) for an account of schwa deletion that does not require reference to a trochaic foot).

iambic languages are permitted by the inventory of foot types made available by UG (see e.g. Hayes 1985, 1987, 1995; McCarthy & Prince 1986, 1993a, 1995, among others; cf. Altshuler 2009). Though non-iterative and right-to-left iambs are attested, these are highly marked (see e.g. Hayes 1995).

The following sections will show how French does not look like an iambic language with respect to any of these dimensions.

3.1.2.4.1 Weight (in)sensitivity

If French were analyzed as an iambic language, it would have to be analyzed as weight-insensitive, as Goad & Prévost (2011) demonstrate. Relevant here are inherently long vowels that French is argued to have (Walker 1984, Thibault & Ouellet 1996). Some researchers have argued that these, as well as closed syllables, do attract stress (Paradis & Deshaies 1990, Scullen 1997), especially in Québec French. On the face of it, this suggests that French might be a weight-sensitive language and analyzing it as iambic might not be so problematic, as heavy syllables will, then, never be in foot-dependent position, as with typical iambic systems.

Such a conclusion does not, however, seem to be accurate for two reasons. First, syllables with a coda (which are potentially heavy) are reported to attract prominence only variably in French. If French prominence were foot-based, this behavior would be rule-governed, and as with other languages with weight-sensitivity, heavy syllables would always attract stress. Such is not the case for French. Second, and perhaps more importantly, as Goad & Prévost (2011) argue, weight-insensitive parses seem to be licit, again at least in Québec French, when a long vowel immediately precedes the phrase-final open syllable. In such cases, iambic languages that are weight-sensitive would stress the syllable with the long vowel, as in (10a) whereas stressing the phrase-final syllable, as in (10b), is possibly the norm in (Québec) French, at least according to Thibault & Ouellet (1996); that is, despite the long vowel in the penultimate syllable, the final syllable typically receives prominence (examples from Goad & Prévost 2011).

(10)	a. mɛ́:zɔ̃	b. mɛ:zɔ̃́	c. mɛzɔ̃́	*maison*	“house”
	ʒǿ:d͡zi	ʒø:d͡zí	ʒød͡zí	*jeudi*	“Thursday”

It should be noted, however, that, as Goad & Prévost (2011) also discuss, some researchers (e.g. Walker 1984 and Scullen 1997) argue against the presence of parses like (10b), and suggest, instead, that only (10a) and (10c) are attested in French. If that is true, French is not necessarily weight-insensitive. However, that vowel length is variable (as is evident from the presence of parses like (10c), along with (10a)) is still problematic for a weight-sensitive analysis of French, for this variable behavior could be because phrasal prominence, which is characterized by greater duration, variably falls on the penult (see Thibault & Ouellet (1996) for a similar argument).

To summarize, then, even though some syllables with long vowels or codas do seem to attract stress in French, resulting in parses that are consistent with a weight-sensitive analysis of the language, as in (10a), if such patterns as (10b) exist, as argued by Thibault & Ouellet (1996), weight-insensitive parses are possible in French, casting doubt on an analysis of French as an iambic language. This is true whether patterns like (10b) are the norm (as Thibault & Ouellet argue) or not; even if (10b) is only variably attested, as suggested by the presence of contrasting opinions on the issue, this would, at best, mean that long vowels are variably weight-sensitive, which, in turn, suggests that weight-insensitive parses are (at least sometimes) permitted, unlike in the vast majority of iambic systems.

3.1.2.4.2 Direction of foot construction

Weight-insensitivity is perhaps the strongest evidence against analyzing French as an iambic language, if the quantity-insensitive parses in (10b) truly exist. In addition, there exist other reasons, as mentioned above, for not considering French as iambic. One is that iambic languages prefer left-to-right footing (Hayes 1991, 1995). In fact, some researchers argue that there are no right-to-left iambic languages (Kager 1993a, 1993b; McCarthy & Prince 1993b). French, however, cannot be analyzed as left-to-right; in words longer than two syllables, the only way to place stress on the final syllable is through right-to-left parsing, as indicated in (11a); the alternative, left-to-right parsing, would result in the incorrect stress patterns given in (11b) or (11c), depending on whether codas contribute weight or not. Even if initial syllables were to be analyzed as extrametrical, as in (11d), which is hard to motivate for any language (Hayes 1982, 1995),[9] the closest that stress could fall to the right edge in a word of this length would be the antepenultimate syllable:

---

[9] One good piece of evidence against leftmost extrametricality is that, out of the set of logically possible fixed single stress systems, only five are attested: initial, peninitial, final, penultimate and antepenultimate stress, as indicated by Hyman's (1977) and Gordon's (2002) crosslinguistic surveys of stress systems. If leftmost extrametricality was possible, languages with postpeninitial stress (third from the left) would also be attested through a left-to-right noniterative iamb: e.g. [<σ>(σσ́)σσσ].

(11) a. [tɛʁminɔ(lɔʒí)] b. *[(tɛʁmí)nɔlɔʒi] c. *[(tɛ́ʁ)minɔlɔʒi] d. *[<tɛʁ>(minɔ́)lɔʒi]

terminologie "terminology"

Since French "stress" would have to be analyzed as non-Iterative, obligatorily falling only on final syllables, foot construction would have to start from the right edge in order for stress to fall on the final syllable. This leads us to yet another area where French differs from typical iambic languages, which, as mentioned above, are normally iterative (Hayes 1995). The next section deals with this issue.

3.1.2.4.3 (Non)iterativity

Footing in French is non-iterative, and is analyzed as such even by researchers who consider French to be iambic (see e.g. Charette 1991, Goad & Prévost 2011). Charette (1991), for example, argues that French constructs a single iambic foot at the right edge, as in (11a) above.

That being said, there have been various claims in the literature that French does have secondary stress (e.g. Verluyten 1988, Scullen 1997). Montreuil (2002) calls these "severely misguided." Perhaps not surprisingly, what look like cases of secondary stress can, in fact, be captured through what Fónagy (1979) refers to as "accentual arc;" the first and final syllables in a domain receive stress/prominence, out of which the first is optional. This is also compatible with Jun & Fougeron's (2000) LHiLH* tonal sequence for the PPh. The examples in (12), from Goad & Prévost (2011), illustrate, as these researchers also explain, that analyzing French as a truly iterative language predicts the incorrect pattern in longer words in (12b), as opposed to the attested forms in (12a), where there is a maximum of two positions of prominence in the domain, irrespective of how long the word is:

(12) a. Accentual arc: b. Iterative footing:

[kɔ̀rdəlɛ́t]	[kɔ̀rdəlɛ́t]	*cordelette*	"rope"
[kɔ̃̀presibilité]	*[kɔ̃prèsibìlité]	*compressibilité*	"compressibility"
[àristɔtelisjɛ̃́]	*[arìstɔtélisjɛ̃́]	*aristotélicien*	"Aristotelian"

Further, as noted again by Goad & Prévost (2011), if French had true Iterativity, instead of the accentual arc or LHiLH* intonational pattern, we would expect the words in (12a) to keep their secondary stress in phrases, which they do not, as (13) illustrates:

(13) [kɔ̀rdəlɛt orɑ̃́ʒ]PPh *[kɔ̀rdəlɛ́t orɑ̃́ʒ]PPh *cordelette orange* "orange rope"

In sum, these patterns in French can best be accounted for by means of the accentual arc of Fónagy (1979) or the LHiLH* phrasal melody of Jun & Fougeron (2000), and cannot, by any means, be captured through iterative footing in the conventional sense.

One (non-iterative) foot-based account that could capture both final and initial accent in a unified manner is that of Goad & Buckley (2006) and Goad & Prévost (2011) (see note 4 in Section 3.1.2.2), where an iambic foot is built at the right edge of the rightmost PWd in a PPh and a trochaic foot at the left edge of the leftmost PWd:

(14) a. [[(ò)(perá)]$_{PWd}$]$_{PPh}$ *opéra* ‘opera’
b. [[(ìnɛs)(peré)]$_{PWd}$]$_{PPh}$ *inespérée* ‘unhoped for’
c. [la [(kɔ̃̀pre)sibi(lité)$_{PWd}$]$_{PPh}$ *la compressibilité* ‘the compressibility
d. [ʏn [(kɔ̀rdə)lɛt]$_{PWd}$[(orɑ̃́ʒ)]$_{PWd}$]$_{PPh}$ *une cordelette orange* ‘an orange rope’

This account has, however, certain formal implications that are unusual for stress languages. For example, though the proposal can effectively capture both final and initial stress in French, as well as the optional behaviour of the latter (see note 4), two different types of feet would be required in the same language. This, though theoretically possible (e.g. if one adopts OT), is highly marked; in the unmarked case, languages are either trochaic or iambic.

Second, and more importantly, under this proposal, iambic feet are built from the right edge and trochaic from the left edge. If such a system is possible, the implication is that there should also be systems with the inverse pattern, where iambic feet are built from the left edge and trochaic from the right, that is, systems in which the second syllable is consistently stressed from both the left and the right edge. To my knowledge, no such system exists. This is despite the fact that such a system, with left-to-right iambs, would be less marked.

3.1.3 Evidence *for* the Foot in French?

As must have been clear from the discussion above, the evidence presented here in favour of a footless analysis of French owes much to work by Goad & Prévost (2011), although I depart from them in concluding that French *is* a footless language like Turkish. A footless analysis of French is, however, not as straightforward as a footless analysis of Turkish is. In fact, after carefully weighing the evidence for a footed vs. footless analysis of French, Goad & Prévost (2011) opt for the former analysis, based on certain formal evidence *for* the Foot in French (see below), and also based partially on the widely held hypothesis that a footless language would be one with a highly marked Prosodic Hierarchy (given especially their interpretation of the data they examine from child French (see Section 3.3.2)). Given the Turkish facts illustrated in Chapter 2, the last concern is perhaps not at issue any more, as there is, then, at least one other language without a Foot. Nevertheless, a complete account of French prosody should present evidence for the Foot, too, which is what this section aims to do. Most of the arguments and data in this section come directly from Goad & Prévost (2011).

3.1.3.1 Clash resolution

Goad & Prévost (2011) present two main types of evidence for the Foot in French, one from clash resolution, the other from schwa realization in compounds. To begin with, drawing on earlier research (e.g. Mazzola 1992, 1993, Hoskins 1994, Post 2000, 2003), they illustrate a case of stress clash resolution observed in compounds and DPs with attributive adjectives. In an example like (15), for example, while final stress is possible in each constituent of the compound in (15a), it is not in (15b). The authors attribute the ungrammaticality of the second form to the observation that stress clash is resolved through leftward displacement of the final stress of the initial word (examples from Goad & Prévost 2011; adapted from Mazzola 1993).

(15) a. [marìkrɪstín] *Marie-Christine*

b. [màriróz] *[marìróz] *Marie-Rose*

The authors argue that since each constituent of a compound forms a PWd, and thus a domain for stress assignment, clash resolution motivates the presence of word-level stress in French since there could be no clash resolution without the Foot and the PWd.

Though this is certainly a possible analysis of the data, alternative analyses exist. Goad & Prévost's analysis is based on the assumption that each constituent in a compound has final accent precisely because it is in PWd-final position; when the second constituent is monosyllabic, then, final stress on the first PWd is illicit since that would create stress class with the immediately following syllable:

(16) $[(\text{marí})_{\text{Ft}}]_{\text{PWd}} + [(\text{róz})_{\text{Ft}}]_{\text{PWd}} \rightarrow [[(\text{mà})_{\text{Ft}}\ \text{ri}]_{\text{PWd}}\ [(\text{róz})_{\text{Ft}}]_{\text{PWd}}]_{\text{PWd}}$

An alternative interpretation of these facts is to assume, as with the intonational approaches, that the two constituents of the compound will together form a PPh, and given the discussion on French prominence above in Section 3.1.1, the final syllable of this PPh will bear a high (H) tone, along with another (secondary) H on the first or second syllable of the PPh. In other words, the LHiLH* tonal pattern proposed by Jun & Fougeron (2000) would also predict [marìkrıstín] and [màriróz] correctly, while excluding *[marìróz]. The final (ungrammatical) form would require the tonal patten LHH (or LHiH*), which can be excluded without any recourse to stress clash. In addition, as Goad & Prévost note, [màrikrıstín] and [marikrıstín] are also possible, along with [marìkrıstín], which could be due to the variable and optional placement of initial accent, i.e. that it can fall either on the first or the second syllable of a PPh, or on neither. In sum, then, though there may be some evidence for foot structure on the basis of the data discussed here, the evidence is inconclusive.

3.1.3.2 Schwa realization in compounds

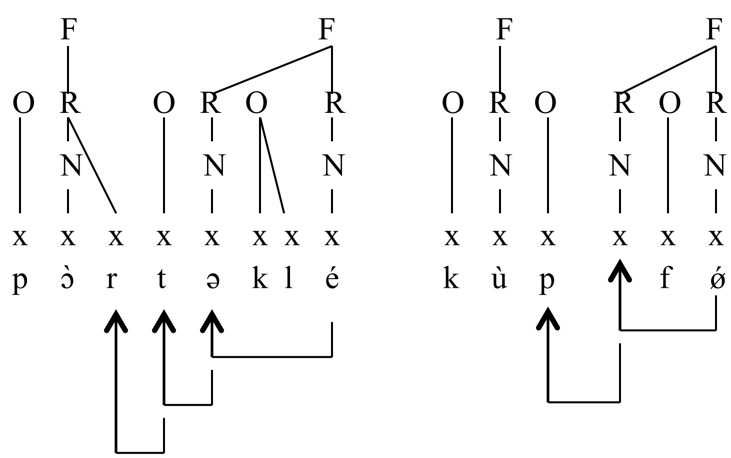
Another type of evidence Goad & Prévost (2011) present for the Foot in French involves schwa realization in compounds. As Charette (1991) observes, in a compound, where the first constituent ends in an orthographic schwa (*e*), and the second is monosyllabic, if *e* is preceded by a cluster, as in (17a), then it surfaces as schwa. On the other hand, *e* is not realized as schwa (the position remains empty) if it is not preceded by a cluster (see (17b)) (despite being followed by a monosyllabic word), or if the second word is not monosyllabic (see (17c)) (despite being preceded by a cluster), or if it is neither preceded by a cluster nor followed by a monosyllabic word (see (17d)):

(17)	a. porte-clés	[pɔ̀rtəklé]	"key ring"	
	b. coupe-feu	[kùpfǿ]	"firebreak"	
	c. porte-manteau	[pɔ̀rtmɑ̃tó]	"coat rack"	
	d. coupe-papier	[kùppapjé]	"paper knife"	(Charette 1991)

As discussed in Goad & Prévost (2011), according to the Government Phonology analysis of Charette (1991), the difference between the two patterns stems from the manner in which the empty position is properly governed. In (17c-d), *e* is domain-final; it is thus properly governed and the position can thereby remain empty (see further below). In (17a-b), *e* is incorporated into the dependent position of the foot in the second constituent of the compound, because the second constituent is monosyllabic (see (18a-b)) (structures modified from Goad &

Prévost 2011). Even though *e* is no longer domain-final in these forms, it can be properly governed by the following overtly-realized vowel. However, in (17a) (unlike in (17b)), *e* must still be realized as schwa, because, even though properly governed, if *e* were to remain as a word-internal empty nucleus, it would not be able to govern the preceding onset consonant (i.e. [t]) since the onset consonant itself has to govern the preceding coda (i.e. [r]). In a form like (17b) (i.e. when *e* is not preceded by a cluster), on the other hand, the empty nucleus can govern the preceding onset (i.e. [p]), for the onset here does not itself govern any other consonant (see (18b)). Returning to (17c) and (17d) (i.e. cases where the second constituent is bisyllabic), since the empty position is followed by two phonetically realized vowels, a binary foot can be created internal to the second constituent, and the empty position can remain in domain-final position.

(18) a. [pɔ̀rtəklé] b. [kùpfǿ]



These patterns, Goad & Prévost (2011) point out, indicate that Foot Binarity (at the syllabic level) is satisfied whenever possible, presenting evidence that the Foot is relevant in French.

While this is certainly a possible analysis of the data, it is not clear why schwa in forms like (17c), and particularly (17d), cannot be incorporated into the dependent position of the first foot, since this foot, on Goad & Prévost's (2011) analysis, is trochaic, and schwa would, thus, be able to accommodate its dependent position. Charette (1991) does not posit initial trochees; so the issue is not necessarily problematic for her analysis. However, as mentioned above, a complete analysis of French prominence, such as that of Goad & Prévost (2011), would require the initial trochee. This leaves the question of what, then, if not foot structure, is responsible for this dichotomy, for which I do not have an answer, either.

All things considered, though evidence for a footless analysis of French might not be as strong as it is for Turkish, and though a footed analysis of French along the lines of Goad & Buckley (2006) and Goad & Prévost (2011) is indeed possible, as supported by some evidence, there seems to be good reason to conclude that French, as with Turkish, assigns no foot structure, as the evidence for a footless analysis of this language seems stronger than for the converse, a footed analysis.

3.1.4 Other footless languages?

If footless languages are indeed possible, the best candidates for such languages would be fixed stress languages such as French (Turkish, too, is considered a fixed-stress language, despite its well-known 'exceptional stress'). Speakers of such languages, specifically French, have already been claimed to demonstrate "stress-deafness" (e.g. Dupoux et al. 1997, Peperkamp & Dupoux 2002). These languages have, however, often been analyzed as having “unbounded feet,” in the formal phonological literature, by researchers who believe in the necessity of every language having a Foot. A comparison of Turkish regular fixed word-final stress and exceptional stress seems to suggest, however, that Turkish regular stress is not foot-based, but, rather, is intonational prominence falling on the final syllable of prosodic words in the absence of foot structure, as demonstrated in Chapter 2 above. Several facts have, likewise, been presented in this chapter in favor of the same argument in French. If the argument we made about Turkish and French is indeed correct, this also opens up the possibility of reanalyzing other fixed stress languages as footless.

In particular, the so called “Default-to-Opposite Edge” stress languages present some evidence for lack of footing. In these languages, default stress falls on one edge of a word whereas some morphemes (or heavy syllables, depending on the language) have to be stressed, and when they are present in a word, the opposite edge attracts primary stress. It could be that these languages, like French, have no foot structure and instead have default intonational prominence marking one edge (say the right edge of a PWd), but that they differ from French in that they have exceptional footing as well, as in Turkish, and given such a foot, intonational prominence will be attracted to this foot, as this foot will be the strongest constituent within the PWd. This is possible particularly for languages where opposite-edge stress is attracted to morphemes, rather than heavy syllables. In fact, Gordon (2000) has already suggested that default “stress” in most default-to-opposite edge languages (including those where the opposite edge stress is attracted to heavy syllables) is subject to reanalysis as intonational prominence, rather than stress.

One piece of evidence for analyzing the default stress of Default-to-Opposite Edge languages as intonational prominence (with no foot structure) comes from the observation that in some of these languages, there are different acoustic cues for default vs. opposite edge stress (as is the case with Turkish regular vs. exceptional stress, as discussed above). For example, Chuvash, a Turkic language spoken in Central Russia, puts stress on the leftmost light syllable in a word with only light syllables, but if a heavy syllable is available, then the rightmost heavy syllable bears stress (heavy, in this case, being a syllable with a non-central vowel) (Krueger 1961, Gordon 2000). Dobrovolsky (1999) found, however, that the default light-syllable "stress" in Chuvash is not accompanied by greater intensity, or duration, like true stress is in stress languages, but is instead accompanied only by an F0 peak. Heavy-syllable stress, on the other hand, is accompanied by at least one of the two other cues to stress, greater intensity or duration. In other words, as Gordon (2000) also notes, it seems like the so-called default stress in this language is more like intonational prominence as in Turkish, rather than real foot-based stress.

Another type of evidence for these languages being footless would be if some of them were to violate the Minimal Word requirement, which does seem to be the case: Huasteco, a Mayan language spoken in Mexico, for example, puts stress on the rightmost CVV if such a syllable is available, otherwise on the leftmost syllable, i.e. it is a typical Default-to-Opposite Edge stress language. In this language, the minimal word is CVX (CVV or CVC). However, CVC does not function as heavy in the calculation of stress (Garrett 1999), and cannot, therefore, form a foot by itself. The fact that there are CVC words in this language even though CVC does not count as heavy (and cannot thus create a binary foot) seems to suggest, by itself, that the Minimal Word requirement is freely violated.

3.2 English stress

Having analyzed Turkish and French prominence, and argued that both languages lack foot structure, we turn now to English, the third language to be investigated in this thesis. The presence of foot structure in English words, unlike Turkish and French, is indisputed. Researchers concur that every PWd in English obligatorily contains at least one binary foot constructed from the right edge of the PWd.[10] This is evident from the fact that every lexical word, in English, has at least one stressed syllable, and that there are no lexical words smaller than a binary foot. Further, stressed syllables, in English, involve not only higher F0 (pitch) values, but also increased intensity and duration (Fry 1955, Lieberman 1960, Beckman 1986).

I will, therefore, assume, as with perhaps all of the recent literature on English prominence, that English is a stress language, obligatorily assigning a foot for every lexical word, and will devote this section, instead, to an analysis of the parameter settings associated with foot construction in English.

Because of its complexity, English stress has been the topic of much research in the generative tradition, starting with Chomsky & Halle's (1968) *Sound Patterns of English (SPE)*. The metrical theory to be employed here is the

---

[10] Most function words such as the articles "a" and "the", unlike lexical words, do not comprise a PWd (McCarthy & Prince 1993a), and they are, thus, not stressed and do not need to be binary.

one proposed in Liberman (1975) and later developed in Liberman & Prince (1977), Selkirk (1980), Hayes (1981), and Halle & Vergnaud (1987).

We start with the following data, modified from Kager (1989: 28) (secondary stress added), which are representative of English nouns. Notice that while the forms in (19a) have antepenultimate stress, the rest bear stress on the penult.

(19)	a. <u>Light penult</u>	b. <u>VV penult</u>	c. <u>VC penult</u>	d. <u>Light penult/bisyllabic</u>
	América	Àrizóna	Àtlánta	Ánna
	lábyrinth	Màssachúsetts	ellípsis	Vénice
	génesis	aróma	appéndix	cábin
	aspáragus	Òklahóma	agénda	vílla
	Mìnneápolis	Àpalàchicóla	synópsis	éffort

As Kager (1989) notes, the same pattern is shared by suffixed nouns and adjectives, too, as (20) illustrates (again slightly revised from Kager):

(20)	a. présid-ent	b. compón-ent	c. detérg-ent	d. prés-ent
	munícip-al	anècdót-al	fratérn-al	pén-al
	signífic-ant	compláis-ant	relúct-ant	léth-al
	calámit-ous	desír-ous	treménd-ous	jeál-ous

What these data show, as was first noted by Chomsky & Halle (1968), is that primary stress, in English, falls on the antepenult, if present, if the penult is light, and on the penult otherwise.[11] On a parametric theory (e.g. Selkirk 1980, 1984, Hayes 1981, Prince 1983), these patterns reveal several things about the correct settings of prosodic parameters in English. First of all, the last syllable is always

[11] Verbs behave slightly differently as we will explain below.

invisible to stress assignment,[12] suggesting that Extrametricality is set to *Yes* in English; the last syllable of English nouns, as well as (almost) all adjectival suffixes, is invisible to stress assignment (Hayes 1981, 1982):[13]

(21) Extrametricality: Yes | No

If final syllables are extrametrical, the antepenultimate stress pattern observed in (19a) is evidence that foot construction is right-to-left and feet are left-headed (trochaic):

(22) Direction of foot construction: Right-to-Left | Left-to-Right

(23) Foot-type: Left-headed (trochee) | Right-headed (iamb)

Only under these assumptions can words like *América* and *génesis* (both from (19a)) receive a unified treatment. Given only a word like *América*, right-to-left trochees and left-to-right iambs predict the same surface stress: [A(méri)<ca>] and *[(Amé)ri<ca>] respectively. Given also *génesis*, on the other hand, it is evident that the analysis should be based on (right-to-left) trochees, i.e. [(géne)<sis>]; analyzing it as involving a left-to-right iamb would violate Hayes' (1995) Priority Clause since there would, then, have to be a degenerate foot located at the edge where foot construction starts: *[(gé)ne<sis>].

---

[12] Note that exceptionally some words with final heavy syllables, such as *políce* and *raccóon*, have final stress (see Halle and Vergnaud 1987 for more on these).

[13] The notion of Extrametricality was first introduced in Liberman & Prince (1977) to account for the exceptional behavior of a set of English suffixes. The version introduced by Hayes applies more broadly to all polysyllabic English nouns.

A comparison of the data in (19a) with (19b) and (19c) illustrates, further, that Weight-Sensitivity is set to *Yes* in English, for heavy syllables, when present, are stressed. In other words, syllables that are heavy, whether through a long vowel as in (19b) or through a coda as in (19c), have to be in the head position of a foot:

(24) Weight-Sensitivity: Yes | No

The *Yes* setting of Weight-Sensitivity is, then, the reason for the lack of antepenultimate stress in words of the profile in (19b) and (19c). Therefore, no patterns such as **ároma* and **éllipsis* emerge, for they would have a heavy syllable in the dependent position of a foot: *[(ároʊ)<mə>] and [(ílɪp)<sɪs>] respectively (i.e. instead of the attested [ə(róʊ)<mə>] and [ɪ(líp)<sɪs>]).

Further, that words like *aróma* and *ellípsis* do not have initial secondary stress, i.e. that the initial light (L) syllable is left unparsed, is evidence that Foot Binarity is satisfied in English, and is satisfied at the moraic level. That is every foot, in English, must be composed of at least two moras:

(25) Foot Binarity: Yes | No (at the moraic level)

The alternatives, that feet are binary at the syllabic level or the permission of a non-binary degenerate foot at the end of foot construction, would both result in initial stress in *aroma* and *ellipsis*, with parses like *[(ároʊ)<mə>] and *[(à)(róʊ)<mə>] respectively.

Note that in bisyllabic words with a light penult (see (19d) and (20d)), which are stressed on the penult, satisfaction of Foot Binarity would result in a violation of Extrametricality, e.g. [(σ́σ)]. Satisfying Extrametricality, on the other hand, would require violating Foot Binarity, i.e. [(σ́)<σ>]. That is, in order to satisfy a higher-ranking requirement, that every PWd must have at least one syllable that is stressed, a stress pattern emerges in the language which is in conflict with the correct setting of one of these two parameters. For words that end in a final light syllable (e.g. *Ánna*, *vílla*), a violation of either Foot Binarity or Extrametricality would equally be sufficient to account for these data, i.e. [(ví)<lə>] and [(vílə)] respectively. Violation of Extrametricality will, however, not be able to account for the initial stress in bisyllabic forms that end in a heavy syllable (e.g. *Vénice*, *cábin*): Although the final syllable is heavy, the (light) penult is stressed in these forms. If Extrametricality was exceptionally violated in these cases, final syllables would bear stress, given that Weight-Sensitivity is set to *Yes* in English, i.e. *[kæ(bín)]. That this is not what is observed in the data is evidence that it is Foot Binarity that is exceptionally violated in bisyllabic words with a light penult, i.e. *[(kǽ)<bɪn>]. Of course, as mentioned above, it is not possible to know the exact answer for bisyllabic words with two light syllables, such as *villa*, [vílə]. Nevertheless, for expository reasons, I will assume here that it is always Foot Binarity that is violated in bisyllabic words with a light penult (more on this in Chapter 6).

Turning back to longer forms in (19) and (20), the fact that secondary stress appears in words that are long enough for the creation of more than one binary foot, such as *Mìnnesóta* and *Àpalàchicóla* is evidence that the Iterativity parameter is set to *Yes* in English (see (26)), which is illustrated in (27) below:

(26) Iterativity: Yes | No

(27) a. [(mìnə)(sóʊ)<tə>]   b. [(æ̀pə)(læ̀tʃə)(kóʊ)<lə>]

The words in (27) further illustrate that feet are *maximally* binary in English, i.e. bounded, since patterns such as *[(mínəsoʊ)<tə>] and *[(ǽpəlætʃəkoʊ)<lə>] are not observed:

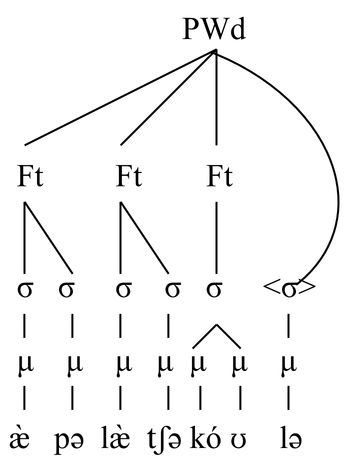
(28) Boundedness: Yes | No

Finally, as the words in (27) illustrate, End-Rule, in English, is set to *Right*, as the head of the rightmost foot bears primary stress. In other words, the rightmost foot within the PWd heads the PWd:

(29) End-Rule: Left | Right

All of these parameter settings are illustrated with the following representation for the word *Àpalàchicóla*:

(30)



Verbs behave slightly differently than nouns (and derived adjectives) in English. Though nouns will be the subject of the experiments in this thesis, a complete account of English stress must also capture the facts observed in the verbal domain. Consider the words below in (31), slightly modified from Kager (1989: 29). The words in each column differ from each other with respect to their stress pattern:

(31)

a. VC-final	b. VVC-final	c. VCC-final
devélop	màintáin	tòrmént
astónish	appéar	usúrp
surrénder	eráse	expéct
demólish	revéal	collápse
embárrass	allów	molést

On the surface, the words in (31b) and (31c) seem not to have extrametricality, for they are stressed on their final syllable. Given only these words, one could argue that Extrametricality is set to *No* for English verbs. That would, however, not account for why the penult, rather than the final syllable, is stressed in forms like (31a). In fact, as Kager (1989) also notes, the forms in (31a) seemingly violate Weight-Sensitivity. Such is not the case, however, as Hayes (1982) argues: on Hayes' proposal, all the parameter settings for English verbs are the same as English nouns, including Weight-Sensitivity, with the exception of Extrametricality; for verbs, the final consonant is extrametrical, rather than the whole syllable.[14] Given this, all the words in (31) receive a unified treatment;

[14] Underived adjectives behave like verbs in English; see e.g. *illícit*, *remóte* and *ovért* (which pattern similarly to the verbs in (31a), (31b) and (31c) respectively. In fact, it could be stated that all adjectives behave like verbs, but derived adjectives, as in (20) above, involve morpheme (suffix) extrametricality (Hayes 1982).

binary weight-sensitive trochaic feet are constructed from right-to-left, but the final consonant is ignored, not the final syllable. This is illustrated in (32) below:

(32) a. [dɪ(vɛ́lə)<p>] b. [ɪ(réɪ)<s>] c. [kə(lǽp)<s>]

As seen, when the final consonant is ignored, the final syllable becomes light for (32a), and the penult is, thus, stressed in order to have a binary trochee. (32b) and (32c) differ from (32a) in that, even when the final consonant is ignored, the syllable is still heavy, either by means of a branching nucleus as in (32b) or a simple nucleus + coda sequence as in (32c).

Finally, (33) illustrates how this account captures the patterns of secondary stress in (31):

(33) [(tɔ̀r)(mɛ́n)<t>]

After the final consonant is ignored, (33) is still long enough to accommodate more than one binary (moraic) trochee. That is, the same parameter settings that account for secondary stress in nouns and adjectives can account for secondary stress in verbs. Note that if this word were a noun, it would not bear secondary stress, for the final syllable would, then, be extrametrical, rather than the final consonant, as mentioned above, leaving only one (heavy) syllable that can be footed. In fact, for this very reason, the noun version of *torment* is stressed on its initial syllable: [(tɔ́r)<mɛnt>] (n.) (compare with (33), *torment* (v.)).

In conclusion, the parameter settings for stress in English can be summarized as follows:

(34) a. Boundedness: Yes
b. Foot-type: Left-headed (i.e. trochee)
c. Iterativity: Yes
d. Direction of foot construction: Right-to-left (R-L)
e. Extrametricality: Yes (final syllables for nouns, final consonants for verbs)
f. Foot Binarity: Yes
g. End Rule: Right

In other words, English builds iterative, binary, weight-sensitive trochaic feet from right-to-left, ignoring the rightmost syllable (or consonant in the case of verbs), and the head of the rightmost foot bears primary stress, by means of End-Rule/Right.

3.3 Additional evidence for the parametric status of the Foot

Having covered the prosodic grammars of Turkish, French and English, and argued that the first two are footless, we now present additional evidence for the proposal that the presence/absence of the Foot is parametric. Such evidence comes from both L1 acquisition (Section 3.3.1) and bilingualism data (Section 3.3.2). We start with L1 acquisition facts. This section also serves to demonstrate that Footed-*No* is the default option for this parameter, assumed initially by *all* children, even when they are learning a footed language.

3.3.1 Evidence from L1 acquisition

In an approach that views the initial state of language acquisition as one that is as specific/narrow as possible - e.g. one that is targeted by the most features or parameters in the output (see e.g. Hale & Reiss 2003), or one where the learner starts with the unmarked setting of *all* parameters (as with e.g. Dresher & Kaye

1990) - it would be predicted that the child's first assumption, with respect to the prosodic parameters dealt with in this thesis, would be something like "Make binary, left-headed, bounded feet with End-Rule-Left," rather than e.g. "Make feet" or "Have prominence," for the former would be the most narrow (and perhaps the most unmarked) hypothesis, and the one defined by the most specific type of foot.

This assumption does not, however, seem to hold, and children do not seem to make such narrow hypotheses in acquiring prosody; on the contrary, the L1 acquisition literature shows that children's initial outputs are not even in the form of binary feet; they are, in fact, monosyllabic (Jakobson 1941/68), and critically monomoraic, utterances, and these have, thus, been considered to pose a problem for the Prosodic Hierarchy (see e.g. Fikkert 1994, Demuth 1995, Goad 1997). Demuth asks, for example, if a binary foot is the unmarked form of a word, why is it that children start with what look like monomoraic feet? Why would children *not* start immediately with a binary foot, the unmarked form of prosodic words? If the Foot comes as part of Universal Grammar (assuming, as with previous literature, that it is an essential constituent of the Prosodic Hierarchy and that the Prosodic Hierarchy comes as part of Universal Grammar), and if children receive input that contains binary feet, why does the binary Foot not emerge at the very beginning of the language acquisition process?[15]

---

[15] One might argue that what have been transcribed as CV utterances by researchers are, instead, CVV, and are, thus, not in fact subminimal. Although this could certainly be true in some (or many) cases, Goad (to appear) shows, based on Holmes' (1927) data, that this is not the correct analysis at least in this case, and rather, that Holmes' transcriptions were sensitive to differences in length. In doing so, one type of evidence Goad uses is that Holmes provides alternative pronunciations for several words, and some of these reveal the difference between short, half-long and long segments, meaning that he was, in fact, sensitive to length differences in his transcriptions. That is, CV utterances seem to be genuine, at least in this particular case.

Demuth (1995) talks about the possibility that there might be a pre-foot stage where children are agnostic about the language-particular instantiations of foot structure. If so, this creates an even bigger problem, for the Foot is considered a universal constituent of the Prosodic Hierarchy, and every lexical word is assumed to have at least one foot (see e.g. McCarthy & Prince 1986, Selkirk 1995), the lack of which violates HEADEDNESS, a constraint thought to be universally undominated (Selkirk 1995), and predicts the existence of adult languages that violate this constraint across the board.

Goad (1997) circumvents this problem by arguing that the Foot 'matures' (or rather emerges), i.e. that it is not initially available to the child but that it appears later on the basis of positive evidence, and thus, that any constraint which refers to it will be vacuously satisfied. I agree with Goad in that children's early utterances do not contain feet, and that the Foot is projected based on positive evidence. I differ, on the other hand, in that I believe that this is not because the Foot is a universal constituent of UG that becomes available later, but because the presence/absence of the Foot is a parameter with its own *Yes* and *No* settings, *No* being the default setting. Support for this comes from the observation that some languages, like Turkish and French, are indeed footless, as was argued above.

There is, in fact, no evidence to suggest that the monosyllables (or moras) produced during the earliest CV (the Sub-minimal Word) stage by children are footed at all; perhaps, children start with an unfooted monosyllable. In fact, Goad (to appear) presents both formal and empirical evidence that children's monomoraic utterances do indeed lack foot structure. On an empirical level, citing

Holmes' (1927) study of Mollie, an English-learning child at age 18 months, Goad underlines that the bisyllabic utterances produced at the CV stage by Mollie had equal stress on both syllables. This, she argues, must be because Mollie had no foot structure. Though, by themselves, these data could alternatively be interpreted to indicate that Mollie had not yet set Foot-Shape to its correct value (i.e. Trochaic vs. Iambic), taken together with the observation that her monosyllabic utterances seemed to be genuinely monomoraic (see footnote 15), equal stress on both syllables in the bisyllabic words uttered must imply that the Foot had not yet been projected. Otherwise, one would expect augmentation of monosyllabic utterances to bisyllabic (e.g. *da* turning into *dada*) (Goad to appear).

On a formal level, Goad shows that if these monomoraic forms were to be treated as footed, they would violate FT-BIN, which would, in turn, mean that a pattern that is crosslinguistically marked characterizes early grammars, a conclusion that conflicts with much previous research, especially research conducted in the OT framework, where child grammars are argued to differ from adult grammars principally in that markedness constraints take precedence. If early grammars do not have foot structure, however, as considered by Goad (to appear), neither FT-BIN, nor PARSE-σ, the constraint that requires every syllable to be parsed into feet, would be violated; they would both be vacuously satisfied in the absence of feet.

In summary, given the facts of the Subminimal Word stage in L1 acquisition, the theoretical argument that HEADEDNESS violations are not possible should either be revised, or, given that some languages, like Turkish, will be, in the usual case, violating HEADEDNESS at the Foot level, the argument that the Foot is an essential constituent of the Prosodic Hierarchy should be reconsidered. If the

Foot is not an essential constituent in the hierarchy, the position adopted here, lack of it will not, after all, cause any HEADEDNESS violations.

3.3.2 Evidence from bilingual language acquisition

If, as argued above, the Footed-*No* option is indeed children's first hypothesis, and if the Foot is added later based on positive evidence, it is no mystery why children learning footed languages make errors initially in the form of producing footless utterances. Errors are, after all, expected precisely in the condition where children have not yet set a parameter to its marked value (Fikkert 1994). What would be unexpected would be to find children that have the Foot in learning a footless language (though see Goad & Buckley 2006 and Goad & Prévost 2011, who convincingly argue that French children respect foot well-formedness constraints[16]).

Bilingual language acquisition seems to provide further evidence for the default status of the Footed-*No* value: What would happen when a child learns a footed and a footless language simultaneously? Though it has been argued that bilingual children have two different grammars for the two languages they are learning (see e.g. Genesee 1989, Meisel 1989, Genesee et al. 1995, Paradis & Genesee 1996, Genesee 2001), one language influencing the other is a situation commonly observed by researchers working in the area (Paradis & Genesee 1996,

---

[16] I have no explanation for these facts; it could be that PPh-final lengthening in French is interpreted, by some children, as evidence for foot structure. Regardless, this remains a problem for the current account. In fact, from my understanding, this is the reason why Goad (to appear) does not take a side between interpreting the acquisition facts from the CV stage as evidence for the parametric status of the Foot vs. evidence for child grammars as being deviant from adult grammars.

Yip & Matthews 2000, Müller & Hulk 2001). When this happens, it is usually because one language is dominant over the other, though instances of cross-linguistic influence have also been observed in cases where neither language is dominant (see Genesee & Nicoladis 2006). I believe that, in the latter case, given the assumption that the child has separate grammars (and lexicons) for the two languages, what looks like transfer effects on the surface must, in fact, be an indication that the learner is employing the default value of a given parameter, and has not yet set the parameter to the marked value for the language that uses the marked value. The default value will, thus, be used for both the unmarked and the marked language, resulting in the surface effect that the value of the unmarked language is being transferred to the marked language (when in fact what is going on is perhaps a delay in the emergence of the marked value). Similar claims have been made before in the bilingual language acquisition literature with respect to the role of markedness (see e.g. Lleó 2002 and Lleó, Rakow & Kehoe 2004 for work on prosody; Lleó, Kuchenbrandt, Kehoe & Trujillo 2003 and Kehoe, Lleó & Rakow 2004 for work on segmental phonology).

If this is correct, we would expect bilingual children learning footed and footless languages simultaneously to initially have footless outputs for both languages, perhaps even after the Subminimal Word stage. There seems to be some evidence in support of this prediction: Brulard & Carr (2003) observe, in the speech of their child, Tom, acquiring French and English simultaneously, that the French type of (final) stress exists for *all* bisyllabic words, with almost no exceptions, for both French and English from his first words (1;8.0) till 2;6.0.[17] This is despite the fact that their data also demonstrate that the child, otherwise, had two different phonological systems for the two languages. For example, consonant harmony occurred exclusively in English words whereas reduplication occurred exclusively in French words.

When, however, Tom finally started to produce trochees in English, he produced them all accurately, with no exceptions, correcting previously misstressed words as well as producing new words correctly. These findings seem to present evidence for the assumption made in this paper that that Footed-*No* has a default unmarked status (assuming that French is footless).

In conclusion, if footless languages are possible, as I have proposed here, this should, of course, be children's first hypothesis, for otherwise, the incorrect assumption that the target language is footed would require the loss of a constituent (when learning footless languages), which, in this thesis, is hypothesized to be impossible. And equally importantly, it might also require unsetting of other parameters that follow from having feet (such as Bounded-*Yes* vs. *No*, left-headed vs. right-headed, direction of parsing, etc.), for these settings would not necessarily match with the lack of settings required for the target grammar, and would, thus, have to be unlearned, too. And such a *non*-deterministic learner would undo correct, as well as incorrect structures in the

[17] The authors classify French as iambic. Of course, in the absence of further data (such as phonetic measurements, data on iterativity, etc.), we will never know for certain whether the child's outputs were iambic or footless (with final prominence). Nevertheless, given that the authors define "iambic" as "word-final prominence regardless of syllable weight," it is highly likely that the child's outputs were footless.

process (Berwick 1985), which would make the child's task impossibly harder. However, if children's initial hypothesis is not to have feet, they could easily learn a footed language (and the correct settings of other parameters following from having feet) on the basis of positive evidence. For example, a child who starts with the assumption that the target language is footless (CV word stage) will then realize, for a language like English, that the language does indeed have foot structure. He or she will then construct the foot appropriately, with a binary trochee (minimal word stage) for English, and an iamb for iambic languages. Once the child has longer utterances, he or she will have to make decisions about parameters such as Iterativity and End-Rule, and for these, too, the correct settings will be chosen based on positive evidence.

3.4 Conclusion

This and the previous chapter have outlined the lower-level prosodies of the three languages that are investigated in this thesis, Turkish, French and English respectively. It was argued that the Turkish and French grammars, unlike English, do not parse syllables into feet. French, as a result, has no feet, whereas Turkish has some, since some Turkish morphemes are footed in the input, and are footed on the surface, too, through faithfulness to this information. In English, on the other hand, every lexical word is assigned at least one foot by the grammar, as has been suggested by the previous research on this language. It was also argued, based on the L1 acquisition literature, that the footless value (e.g. Turkish, French) is the default value of the Footed-Yes/No parameter proposed here; the Foot, in other words, emerges on the basis of positive evidence in learning a footed language (e.g. English, Spanish). All of this has implications for the second language acquisition of stress. The following chapter, Chapter 4, will accordingly propose a path for the L2 acquisition of prosody; it will be demonstrated not only that the new Footed-Yes/No parameter, but also all other prosodic parameters, which have been proposed in previous literature, interact in complex ways to predict a path for L2 acquisition that is significantly different from the path in L1 acquisition.

Chapter 4: The Prosodic Acquisition Path Hypothesis

4.1. Introduction

I investigate, in this thesis, the second language (L2) acquisition of Turkish word-level stress by learners whose first language (L1) is English or French. As was proposed in Chapter 2, I assume that Turkish is a language whose grammar does not assign foot structure, though, under some exceptional cases, certain syllables are footed, for they come into the computation already footed in the lexicon. I also assume, as with most previous literature, that English differs from Turkish in this regard in that it requires every lexical word to be footed. French, on the other hand, as argued in Chapter 3, is completely footless; that is, it assigns no foot structure, neither regularly by the grammar, nor exceptionally in the input. Given these differences between the three languages, and given a specific learning path for prosody to be proposed in this chapter, there are different predictions for English- and French-speaking learners of L2 Turkish, if one views the initial state of L2 acquisition as that of the L1 settings of parameters, as with the Full Transfer Full Access (FTFA) Hypothesis (e.g. White 1989b, Schwartz & Sprouse 1994, 1996).[1]

The proposal to be made in this chapter has three main components to it, the combined effect of which is the prediction of a learning path or paths for prosody by L2 learners, which I will call the Prosodic Acquisition Path Hypothesis (PAPH), as will be outlined in Section 4.2 and 4.3 below. One of the

[1] In particular, the initial state of L2 acquisition will be 'footless' for French-speaking learners, whereas it will be footed for English-speaking learners, which will, in turn, have important effects on the degree to which either learner population will have difficulties acquiring a (variably) footless language like Turkish.

main tenets of the PAPH is the hypothesis that once a prosodic constituent, such as the Foot, is projected in an L1, learners of a language without that prosodic constituent (i.e. a footless L2 in this case) will not be able to eliminate it from their grammar. As far as L2 acquisition is concerned, it should always be easier, for this reason, to move from a footless language to one that requires feet rather than vice versa, the definition of a "footless language" being one that permits a lexical word to have no syllables that are footed (e.g. both the French- and the Turkish-type), and a foot-requiring language being one that requires at least one syllable in every lexical word to be footed (e.g. English).

The two other main tenets of the PAPH follow from the proposed representation of prosodic parameters in a tree where some parameters are embedded under others. The first tenet is the assumption of a prosodic learning path for L1 acquisition. In addition, it is assumed that all foot-related parameters, such as Foot-Type, Iterativity, etc., are initially *open* (i.e. not pre-set to a certain value) and can stay as such. Once a parameter is *activated* (i.e. set to one value or another) in an L1, though, it should be impossible to deactivate it (i.e. make it open again) in an L2 where this parameter is not relevant.[2] On the other hand, resetting parameters from one value to another (as long as it does not result in a prosodic constituent being removed from the grammar) is predicted to be possible, given that positive evidence is available for both directions (e.g. *Yes* to *No* and *No* to *Yes*). That is, though deactivation is *not* possible, resetting *is*, on this account, forming, respectively, the second and third main components of the

[2] Normally, if a parameter is not relevant in an L2, there is no reason to deactivate it. However, in the current case, since the foot-related parameters interact and since the Foot cannot be expunged from the grammar, the parameters that follow from foot structure will still be relevant for L2 learners.

proposal. Not all types of resetting, though, are hypothesized to be equally easy: certain parameters (and parameter values) are expected to be more difficult to reset than others, on grounds of economy, markedness, and robustness of input, which, as we will see later, is, for the most part, reflected by their location on the tree of parameters proposed in this thesis.

Taken together, the three main components of the proposal predict that in the absence of being able to get rid of the Foot or deactivating parameters that do not play a role in the L2, L1 English-speaking learners of L2 Turkish will largely be restricted to changing parameter values, even at advanced levels, as opposed to French-speaking learners, who are expected to be target-like from the initial stages of language acquisition. Changing parameter values will make English-speaking learners' interlanguage grammar similar, on the surface, to that of the target language, though it will never make it structurally target-like.

The prediction that English-speaking learners will never be structurally target-like does not, however, necessarily mean that they do not have access to UG; only if the strategies they employ result in grammars that are not within the scope of options permitted by UG can we arrive at such a conclusion (White 2003). Learners are predicted not to resort to such options on the current proposal, as it is assumed that UG is available in L2 acquisition.

Certain things are predicted not to occur on the current proposal, even though they would not violate UG. For example, as we shall see, certain learning paths (and interlanguages attained through such paths) are predicted not to occur. All things considered, PAPH is an attempt at proposing a restrictive and falsifiable account of L2 prosody: not only does it predict certain things to happen, but it also predicts certain things *not* to happen, even when they are, in principle, allowed by UG.

The three components of the proposal are, in sum, as follows, and will be covered in more detail in the following section: (i) Once a prosodic constituent, such as the Foot, is projected in an L1, it cannot be expunged from the grammar in learning an L2 without that prosodic constituent; (ii) Once a parameter is activated in an L1, it cannot be deactivated; (iii) Resetting parameters is possible, but resetting certain parameters is more difficult than resetting others, depending on such factors as markedness, robustness of input, and economy. Together, the three components predict an acquisition path or paths for learning second language word-level prosody, a path whose specifics depend on the properties of the L1 and L2 involved.

The remainder of this chapter is organized in the following way: Section 4.2 outlines the hierarchical organization that is hypothesized to hold among prosodic parameters. Section 4.3 outlines the PAPH, and its three main building blocks, as well as providing justification for these. Section 4.4, then, presents the specific predictions of the PAPH in the context of the current study, for L1 English- and French-speaking learners of L2 Turkish, by means of exemplifying the UG-constrained strategies these learners are predicted to adopt.

4.2 Prosodic parameters in a tree

Before discussing the three components of the PAPH, we consider what prosodic parameters look like under this approach.

The tree diagrams in (1) and (2) below provide a near complete set of prosodic parameters that capture word-level stress in the world's languages. The parameter Footed-Yes/No in (1) forms one of the most important claims of the thesis. All of the other parameters (i.e. those in (2)) have been proposed independently in previous research as mentioned in Chapter 2 and 3; the proposal in (2) departs from this literature in that it *embeds* these in a tree (see also Dresher & Kaye 1990 for a similar approach to relationships between parameters). As we will see later, this will be relevant in that it will help determine what is hypothesized to be a more vs. less difficult learning direction, on the current approach, for L2 learners. We start with the Footed-Yes/No parameter.

4.2.1 Footed-Yes/No

Based on the discussion in Chapter 2, I assume that the Foot is not a universal constituent of the Prosodic Hierarchy (contra e.g. Selkirk 1995), but that its presence/absence is parametrically determined. This is illustrated in (1a) below:

(1a) Footedness Parameter

Footed

Yes No

The Prosodic Hierarchy for the two different language types, footed vs. footless, is exemplified in (1b) below:

(1b) i. English, Spanish, etc. type

Intonational Phrase (I)
|
Phonological Phrase (PPh)
|
Prosodic Word (PWd)
|
Foot (Ft)
|
Syllable (σ)

ii. Turkish, French, etc. type

Intonational Phrase (I)
|
Phonological Phrase (PPh)
|
Prosodic Word (PWd)
|
Syllable (σ)

Several types of evidence were provided for this position in Chapters 2 and 3, including: (a) formal and acoustic evidence that emerges from a comparison of regular (word-final) vs. exceptional stress in Turkish (see also Özçelik 2009, to appear); (b) evidence against a foot-based analysis in French; (c) evidence from L1 acquisition and bilingualism.

4.2.2 Parameters that result from having a foot

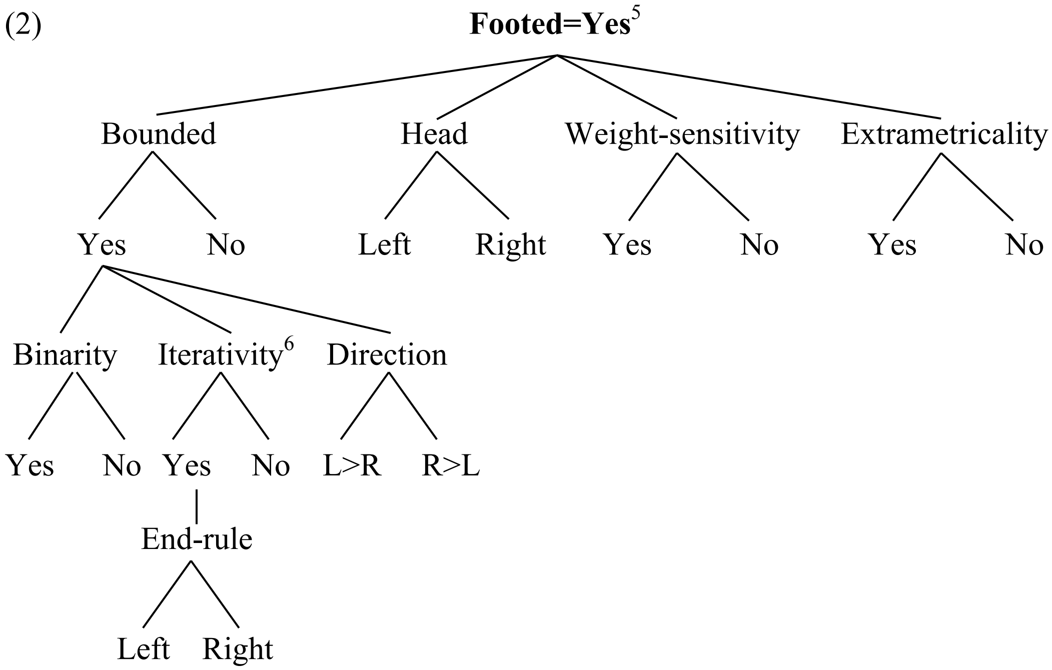
If Footed is set to *Yes* in (1) above, speakers of footed languages such as English[3] will have most (or all) of the parameters that are associated with having a foot set to one value or another (either *Yes* vs. *No* or *Left* vs. *Right*), as demonstrated in (2) below.[4] For speakers of languages like French, on the other hand, since their

[3] As per the discussion in Chapter 2, some of the parameters in (2) can be set in (variably) footless languages like Turkish, too, given that such languages do have feet on the surface (for morphemes that are footed in the input). This, of course, is true given the unified treatment of regular and exceptional (footed) morphemes in Turkish that was proposed in Chapter 2. On a cophonologies account like that of Inkelas & Orgun (1998), the two sets of morphemes, regular vs. exceptional, would be handled by different grammars. The predictions of the two accounts for the proposal made in this chapter do not differ; either way, whether exceptional morphemes are treated by the same grammar as regular morphemes or by a different cophonology, the point here is that regular stress in Turkish does not involve foot structure, which, in turn, has certain predictions for acquisition.

[4] Note that it is crucial for (1) and (2) to be independent of each other on the current proposal, in order to achieve a unified account of prosodic systems of languages like Turkish, which constructs no feet (i.e. Footed=*No* in (1)), but some of the parameters in (2) are still active, given that feet can exist in Turkish as a result of pre-specification (see Chapter 2). I do not differ here from previous research, except for the assumption that the presence of the Foot is parametric. Recent approaches under the OT framework also view the requirement that a language assigns feet (i.e. PARSE-σ on

language has no foot structure, parameters related to footing are all "open," as with child L1 learners of all languages (including English), for whom these parameters are initially open, and are waiting to be set (see Chapter 3).

(2)



It is presumed here that first language acquisition follows the path demonstrated by (2). Once the Foot is projected, the parameters in (2) for which there is positive evidence are set to their correct values, from top to bottom. Only after a *Yes* setting of a parameter can the parameters embedded under it be set to one value or

---

such accounts) as different from the other parameters (or rather 'constraints' on such accounts), for PARSE-σ refers to the Prosodic Hierarchy but not to prominence, whereas other parameters, including Iterativity (or *LAPSE on recent OT accounts), have to do with prominence, but not the Prosodic Hierarchy (see e.g. McCarthy 2003).

[5] Certain parts of the tree could possibly be modified. For example, it might be better to somehow tie together foot head and weight-sensitivity, for we know that iambic languages are always weight-sensitive, whereas trochaic languages can be weight-sensitive or not (see e.g. Hayes 1995). Similarly, some of the parameters could have more structure underneath; Weight-Sensitivity, for example, can be characterized as Weight-Sensitivity-to-Vowels, under which exists Weight-Sensitivity-to-Codas, since all languages that are sensitive to coda weight are also sensitive to the weight of long vowels, but not vice versa. I leave further elaboration of the tree to future research.

[6] Note that in certain rare circumstances, Iterativity can be a property of unbounded feet, too. Such cases are, to my knowledge, limited to languages that are quantity-sensitive, and in which every heavy syllable heads a foot, which is not true Iterativity.

another; they will, otherwise, stay open. If Boundedness is set to *No*, for example, the parser does not look further down, and the parameters below it stay open. If, on the other hand, it is set to *Yes*, the parameters below it may also be activated and set to their correct value based on positive evidence. Similarly, End-Rule can be set (to one value or another) only after Iterativity is set to *Yes*. If Iterativity is set to *No*, the L1 learner will not entertain a setting for End-Rule. In fact, as Dresher & Kaye (1990) point out, the positive cue for End-Rule, i.e. main stress to the left or right of a secondary stress will not be available in languages with non-iterative footing.

This assumes an L1 learner with a deterministic parser (Marcus 1980, Berwick 1985, Dresher & Kaye 1990). A deterministic parser cannot back up when the parser does not work, nor can it undo previously created structures (or substructures) if the parse fails. It is strictly data-driven, and is *local*, which is presumed to aid acquisition (Berwick & Weinberg 1984; Dresher & Kaye 1990). That it is local means, in the current case, that the initial state will contain footless representations, and that the Foot will be added on the basis of positive evidence. In addition, it means that all other parameters in (2) will be set to their correct values, one by one, on the basis of positive evidence, following a path from top to bottom, and that, in doing so, errors will also be treated locally. For example, if the learner has not yet set End-Rule to its correct value (i.e. if it is still open), and the parser encounters words where stresses are stronger at one edge of words than the other, it will only attempt to change the value of End-Rule (from open to *Left or Right*), and will not backtrack. It will not, for example, attempt to change the value of Iterativity or Boundedness, when faced with structures the current grammar cannot account for, if Iterativity and Boundedness have already been set to their corresponding values. A nondeterministic parser, which has an unlimited backtracking capacity would undo correct structures as well as incorrect ones, which is especially problematic in prosody given that certain output cues can be interpreted as different settings for different parameters (Dresher & Kaye 1990). A word composed of a sequence of heavy and light syllables that is stressed on its first syllable, e.g. H́L, can, for example, either be a weight-sensitive iamb or a weight-(in)sensitive trochee.

Section 4.3 below will outline the three main components of the PAPH, as well as giving formal and empirical evidence for the assumptions made here about the initial state of prosodic parameters.

4.3 Prosodic acquisition path

4.3.1 Impossibility of losing a prosodic constituent

Assuming that UG allows for the variation mentioned in (1) above (see the discussion in Chapters 2 and 3), and that this variation is expressed in terms of a parameter with two values, one of which involves projection of an additional constituent that the other does not, a potential learnability problem arises as the L1 learner tries to determine whether the target language is footed or not. If the L1 learner of a footless language mistakenly assumes that the input suggests a language with the Foot, in order to retreat to the footless value (1b.ii), he or she needs to undo a previously created structure, the Foot. Such undoing of structures is not possible with a deterministic parser (Marcus 1980, Berwick 1985, Dresher & Kaye 1990), the type of parser assumed, in this thesis, to be available to children.

The problem could, however, be averted by ordering the child's hypotheses: If the child's first (default) hypothesis was that the target language is footless, and the Foot was added only on the basis of positive evidence, this constituent would emerge only in the grammars of children learning languages that actually do have foot structure. In the literature on the acquisition of English and Dutch, two footed languages, this seems to be the case. The assumption that the target language is footless does indeed seem to be the first hypothesis of children learning these languages, even though they are footed. This suggests that the Foot is added later, based on positive evidence, as explained in Chapter 3 (see e.g. Fikkert 1994, Demuth 1995, Goad 1997, Goad to appear; cf. Goad & Prévost 2011).

Turning to L2 acquisition, I hypothesize that, as with L1 acquisition, once a prosodic constituent has been projected in the L1, it should be impossible to rid the grammar of it. And since L2 learners start the learning process with the L1 settings of parameters and not with the "default" settings provided by UG (see e.g. White 1989a, 1989c, Schwartz & Sprouse 1996), they should not be able to order their hypotheses in the same way as first language learners. Therefore, I predict that if the L1 has the Foot, interlanguage grammars will have it, too. That is, it should be impossible to move from a Foot-requiring L1 to a footless L2, in contrast to the opposite direction when the L1 exemplifies the default setting.

Note that this is despite the fact that positive evidence seems to be available in both directions in the form of phonetic cues. As was mentioned in Chapter 2, I assume that intensity and/or duration are the cues for foot structure in the languages of the world, in addition to F0 (pitch), whereas only F0 (optionally) accompanies a footless representation of prominence. That intensity and/or duration is always required for a footed representation of word-level prominence and that these cues are always absent from a footless representation[7] will provide L2 learners with positive evidence for the difference between the two.

If positive evidence is available for both settings, the question, then, is why learning is predicted to fail, when removing the Foot from the grammar is required. Though I cannot, at this point, take a firm position on this issue, one possibility could be that the input is not robust enough to allow moving from a footed to a footless setting. There is, after all, no cue for a footless representation of prominence that is not at the same time a cue for the Foot; F0, for instance, is a cue for prominence in footless languages like Turkish, but footed languages also use F0 as a cue for prominence, in addition to using intensity and/or duration, as mentioned above. The additional cue of intensity and/or duration, and its obligatory status at the word-level in languages with a foot projection, might signal to the learner of a footed language that something additional is going on in the target language. For the footed-to-footless direction, on the other hand, that F0 is still present might be enough to incorrectly lead the learner to assume that the target language has foot structure. In fact, the task of such a learner will be even harder in the case of L2 Turkish, since Turkish has some words with exceptional stress, which are footed, and intensity, in such cases, will accompany word-level prominence, which could reinforce the incorrect assumption that the target language is footed.

[7] Though it is true, as mentioned in Chapter 3, that French also uses duration, this is at the PPh-level, not the PWd-level. This is equivalent to phrase-final lengthening. In fact, French, as with Turkish, has no obligatory word-level prominence.

4.3.2 Impossibility of deactivating parameters

The status of the relationship between open vs. already-activated parameters has not, to my knowledge, been discussed in the L2 acquisition literature. There is, however, good reason, based on findings of related research, to assume that once a parameter is set in an L1, it should be impossible to deactivate it (make it dormant). Given the extensive evidence for the proposal that L2 learners start with the L1 settings of all parameters (White 1985, Schwartz & Sprouse 1994, 1996) and that moving from a marked value to an unmarked one is very difficult (see e.g. White 1987, 1989c, 2003), if deactivation of parameters were possible, L2 learners should be able to deactivate all parameters, regardless of the availability of positive evidence, and should, thus, be able to start from scratch, like children, for this would be the most effective way of acquiring a second language, as would be predicted by the Full Access (without Transfer) Hypothesis (e.g. Flynn & Martohardjono 1994, Flynn 1994, Epstein et. Al. 1996). There would, then, be no formal differences between learning a marked vs. unmarked value of a parameter since all learners would have the same starting point, or would at least be able to switch, in a reasonable time period, to the open value of a parameter without much difficulty. Consequently, regardless of the L1 background, the end state of L2 acquisition would be the same target-like grammar. That is, if deactivation of parameters were possible, L2 acquisition would be no different from L1 acquisition.

Since we do not observe this, as demonstrated by previous experimental research, I will hold to the position that it is impossible to deactivate parameters that are already set to one value or another. It should, therefore, be easier to move from an L1 which has not yet set a parameter to one that has already done so rather than vice versa. In the present case, then, L1 English learners of L2 Turkish will not only *not* be able to lose the Foot, but they will also *not* be able to deactivate the parameters under Footed=Yes in (2) that are irrelevant for Turkish regular stress. For example, they will not be able to get rid of the concept of Headedness (foot type) or Boundedness, although they can, I hypothesize, reset the former from *Left* to *Right*, and the latter from *Yes* to *No*.[8] That is, resetting is possible, whereas deactivation is not (more on the issue of resetting in the next section).

There can, however, be '*de facto* deactivation', for some parameters in (2) are dependent on others: a parameter can be de facto deactivated when the parameter it is dependent on is reset from *Yes* to *No*. For example, if one could manage to reset Iterativity from *Yes* to *No*, this means, automatically, that End-Rule is no longer relevant, i.e. is de facto deactivated. Similarly, if one could reset Boundedness from *Yes* to *No*, Binarity and Iterativity (and any parameter under them) will be de facto deactivated. Resetting the Footed parameter in (1a) from *Yes* to *No* would also result in de facto deactivation of all parameters under Footed=Yes in (2), but that is hypothesized to be impossible, as mentioned above, for it requires loss of a constituent, unlike the parameters in (2).

Notice at this point that this predicts certain things *not* to happen; there should, for example, be no interlanguage grammar where a learner deactivates End-Rule, but keeps Iterativity or Boundedness set to *Yes*. This is despite the fact that iterative systems with no End-Rule are attested, e.g. Tübatülabal (e.g. Voegelin 1935, Hayes 1981, Prince 1983). All stresses in a given Tübatülabal

[8] For hypothesized differences in the difficulty of resetting *Yes* to *No* vs. *No* to *Yes*, or *Left* to *Right* vs. *Right* to *Left*, etc., see Section 4.3.3 below.

word are equally strong; thus, there seems to be no main stress (Kager 1993). In other words, the End-Rule parameter, in Tübatülabal, is open, as opposed to in languages such as English. The only way for English-speaking learners to avoid rendering one foot stronger than the other is, then, through resetting Iterativity or Boundedness to *No* (i.e. through *de facto* deactivation of End-Rule, rather than true deactivation).

In sum, under the current account, one cannot deactivate a parameter altogether, though de facto deactivation, in the form of resetting a parameter with embeddings from *Yes* to *No*, thereby rendering the parameters underneath irrelevant, is possible, unless such resetting requires the loss of a constituent, as in (1), where going from *Yes* to *No* is impossible.

4.3.3 Resetting certain parameters/values is more difficult than resetting others

4.3.3.1 Greater difficulty with resetting parameters with embeddings

In the absence of being able to get rid of the Foot (see Section 4.3.1), or deactivate parameters (see 4.3.2), how does the L1 English learner of L2 Turkish (or any other footless language) proceed through the acquisition process? Though it is predicted that, under the current account, such learners (unlike French-speaking learners) should never be able to attain the target end state grammar of Turkish, they should still be able to resort to a variety of UG-constrained options that result in their interlanguage sounding, on the surface, target-*like*, which will be the subject of Section 4.4 below. We will see, in that section, that it is hypothesized that English-speaking learners will be restricted to changing the parameter values in (2). In doing so, they will initially change the settings of terminal parameters, rather than those with embeddings, for terminal parameters have no parameters dependent on them, and so their being reset does not require other parameters to be (de facto) deactivated. This, in turn, leads to a smaller change in the grammar (thereby making it a more *economical* decision). Therefore, resetting Iterativity (or Boundedness) from *Yes* to *No* will likely not be the first option L2 learners will consider, for this will render the End-Rule parameter that is dependent on Iterativity (de facto) inactive, and that, though possible, should be costly, for it involves a big change in the grammar, a change that affects the destiny of multiple parameters. In this regard, resetting Boundedness from *Yes* to *No* should be the most difficult option, for Boundedness is the parameter in (2) with the greatest number of parameters dependent on it. Options such as switching Extrametricality from *Yes* to *No* should be relatively easy, on the other hand, for it is a terminal parameter with no parameters dependent on it. This also means that, for parameters with embedding, *Yes* values will be more difficult to reset to *No* than vice versa, for it is the *Yes* values in (2) that have other parameters dependent on them.

4.3.3.2 Easier to reset from *No* to *Yes*

Although not all of these will directly be tested in this thesis, I predict that, for most of the parameters with *Yes*/*No* settings, whether embedded or not, moving from *Yes* to *No* should be more difficult than from *No* to *Yes*, as the *Yes* settings in (2) are usually more marked than the *No* settings.[9] Therefore, on markedness grounds, since moving from an unmarked value of a parameter to a marked value

[9] This is probably too broad a generalization; it likely does not hold, for example, for Binarity, though see Dresher & Kaye (1990), who assume binary feet are more marked than non-binary for quantity sensitive languages based on availability of input.

is presumed to be easier because of the nature and greater availability of positive evidence (see e.g. White 1987, 1989c, 2003), moving from *No* to *Yes* should always be easier than the converse. When the positive evidence is more robust, this should be easier, and, with the parameters under focus, this is usually the case when moving from *No* to *Yes*.

Take, for example, Weight-sensitivity. In a weight sensitive language, every heavy syllable will be the head of a foot, and will, therefore, be stressed, which is robust information that there is something special about the role of heavy syllables. In a language that is not weight-sensitive, on the other hand, some heavy syllables will still happen to be stressed, whereas some will not (depending on the settings of other parameters, the number of syllables in a word, etc.); this may appear to give conflicting information as to whether the language is weight-sensitive or not (see also the discussion in Section 4.3.3.4.2 below for additional evidence from L1 acquisition).

As an additional example, consider Boundedness: every bounded foot is maximally binary. There is, for example, no way to misanalyze a hypothetical word like *pátakàtalàta* as unbounded; it would likely be footed as (páta)(kàta)(làta), which gives robust evidence that the foot is maximally binary (i.e. bounded). A word like *pátakatalata*, on the other hand, could be analyzed as bounded or as unbounded: (i.e. (páta)katalata or (pátakatalata) respectively), meaning that the evidence for the *No* setting of Boundedness is not as robust. In fact, if Bounded-*Yes* were the unmarked option provided by UG, there would likely be no unbounded languages in the world (except those with weight-sensitivity).

For the other Yes/No parameters, i.e. Extrametricality and Iterativity, I follow Fikkert (1995) in assuming that *No* is the unmarked setting for both. Dresher & Kaye (1990) similarly assume that *No* is the unmarked value for Extrametricality, but differ in their claim that the *Yes* setting is unmarked for Iterativity, arguing that there is positive evidence for the *No* setting of this parameter in the form of the absence of secondary stress. As Fikkert (1995) points out, though, one could also argue that the 'presence' of secondary stress is a positive cue for the *Yes* value of this parameter and, therefore, assume the unmarked value to be *No*. She also presents evidence for this from Dutch child language acquisition data.

In addition, all things being equal, it should always be easier to notice the presence of something rather than its absence; noticing the absence requires access to more forms to be sure that the relevant property is indeed absent. Take, for example, the following situation: In a trochaic weight-sensitive language, trisyllabic words can have secondary stress in words with weight profiles of e.g. HHL, HLL, etc.: (H̀)(H́)L and (H̀)(ĹL) respectively. That is, seeing words with surface stress profiles of H̀H́L and H̀ĹL is sufficient for a learner to activate the *Yes* setting of Iterativity. The converse, however, is not true. If the same learner came across words with stress profiles of HH́L and HĹL, i.e. words *without* secondary stress, this does not necessarily mean that Iterativity in the language being learnt is set to *No*; this could alternatively be due to the possibility that the relevant language is not weight-sensitive (and thus H is not bimoraic). Alternatively, it could also be due to (leftmost) Extrametricality, if such languages exist (see Kager 1989). Yet another possibility is that there is destressing in clash, resulting in one single stress in forms like HH́L and HĹL. Such a learner will clearly need to come across longer words or more word types in order to activate the *No* setting of Iterativity.

To summarize so far, there are two different factors leading to the *Yes* to *No* direction being more difficult than the *No* to *Yes* direction. The effects of the two factors can be disentangled, for we expect much more difficulty in the case of parameters with embedding being reset from *Yes* to *No* than terminal parameters. On the other hand, there should be no difficulties for the *No* to *Yes* direction; this is, after all, a movement towards a marked setting and does not result in the (costly) de facto deactivation of any parameters, for no parameters are embedded under the *No* values.

4.3.3.3 *Left* to *Right* vs. *Right* to *Left* are equally easy

Finally, for parameters in (2) whose values express directions, e.g. left-headed vs. right-headed feet or Left-to-Right vs. Right-to-Left footing, both values are predicted to be equally easy to reset to. These are, on the current account, equally unmarked (see below), as is the case with the head-directionality parameter in syntax (though see Kayne 1994).

From the perspective of robustness of the input, the evidence for either value is equally robust for these parameters, unlike Yes/No parameters. For example, the evidence for whether a foot is left-headed or right-headed is equally robust; the only thing that differs between left-headed feet vs. right-headed feet is the location of the stressed syllable, e.g. (σ́ σ) vs. (σ σ́). Similarly, the difference between a word tree that is strong at the left edge (End-Rule-Left) vs. one that is strong at the right edge (End-Rule-Right) is the location of the word edge where the most prominent stressed syllable occurs, e.g. [(σ́ σ)(σ̀ σ)] vs. [(σ̀ σ)(σ́ σ)] for a trochaic language or $[(\sigma\ \acute{\sigma})(\sigma\ \grave{\sigma})]$ vs. $[(\sigma\ \grave{\sigma})(\sigma\ \acute{\sigma})]$ for an iambic language.

Likewise, the only difference between left-to-right and right-to-left footing (Directionality) is whether an initial/final or peninitial/penultimate syllable is stressed in words with an odd number of syllables, e.g. $[(\acute{\sigma}\ \sigma)\ \sigma]$ v.s. $[\sigma\ (\acute{\sigma}\ \sigma)]$ for a left-to-right vs. right-to-left trochaic language and $[(\sigma\ \acute{\sigma})\ \sigma]$ vs. $[\sigma\ (\sigma\ \acute{\sigma})]$ for a left-to-right vs. right-to-left iambic language. Though it might be argued here that there is better evidence for the left-to-right direction for trochees and right-to-left for iambs, in the form of adjacent syllables that are unstressed, the balance is changed in favor of the opposite direction in languages that allow degenerate feet, in the form of adjacent syllables that are stressed, e.g. $[(\acute{\sigma}\ \sigma)(\acute{\sigma})]$ vs. $[(\acute{\sigma})(\acute{\sigma}\ \sigma)]$ for a left-to-right vs. right-to-left trochaic language and $[(\sigma\ \acute{\sigma})(\acute{\sigma})]$ vs. $[(\acute{\sigma})(\sigma\ \acute{\sigma})]$ for a left-to-right vs. right-to-left iambic language.

In sum, both directions in all Left/Right parameters seem to involve equally robust evidence. There should, therefore, be no difference in level of difficulty between moving from one setting to the other for any of the prosodic parameters in (2) whose values express directions.

4.3.3.4 Evidence from L1 acquisition

Most of the evidence cited above for the equally unmarked status associated with both values of Left/Right parameters and the more marked status of the *Yes* setting of Yes/No parameters came from formal assumptions made about robustness of the input. There is, in addition, some evidence for these assumptions from the findings in the L1 acquisition literature.

Though not all parameters have been studied in L1 acquisition research, one parameter, Foot-Type, a Left/Right parameter, has particularly been investigated.

Some of the findings of this line of research are, in addition, informative of the assumptions made here about the other parameters, including Yes/No parameters. Section 4.3.3.4.1 below provides an overview of the findings of L1 acquisition research on the Foot-Type parameter and discusses its implications for the current proposal. Section 4.3.3.4.2, then, overviews the implications of some of the findings of this and similar research on the other parameters discussed above.

4.3.3.4.1 Against the Trochaic Bias Hypothesis

Early research on the L1 acquisition of stress claimed that there is an initial universal trochaic phase for all learners, including those learning iambic languages (Allen & Hawkins 1978, 1980). This suggests that *Trochaic* is the default setting provided by UG for the Foot-Type parameter, contra the arguments made above for the equally unmarked status of trochaic and iambic grammars, as well as other parameters that express directionality, whose default value, I have assumed, is open (i.e. not initially set to one value or the other).

If the current proposal is correct, then the so-called Trochaic Bias Hypothesis should be incorrect; that is, there should *not* be an initial trochaic phase for all learners, i.e. for those learning iambic languages. Rather, learners of trochaic languages should start with a trochaic (left-headed) foot (once they get enough positive evidence), and learners of iambic languages should start with an iambic (right-headed) foot. In both cases, the parameter should be set to the correct value from the beginning on the basis of positive evidence, since it is not a parameter with values in a subset/superset relationship, nor is it a Yes/No parameter, but is rather a Left/Right one, and thus, neither markedness nor the availability of positive evidence will predict one setting to be earlier than the other.

This prediction seems to hold true, for there has been virtually no evidence so far for a “Trochaic Bias” from L1 acquisition research (see below). In fact, the hypothesis was offered based on the behavior of English-learning children (Allen & Hawkins 1978, 1980), and virtually all evidence for it comes from learners of trochaic languages, e.g. English (Gerken 1991, 1994, Kehoe 1998), Dutch (Fikkert 1994, Wijnen, Krikhaar & den Os 1994), and Greek (Kappa 2000). That is, it is only children learning trochaic languages who seem to choose trochees from the onset of acquisition, and not those learning iambic languages. To my knowledge, the only exception to this so far has been Hebrew-learning children, who were argued to have a trochaic bias (Adam & Bat-El 2008) despite acquiring an iambic language (Bat-El 1993); however, recent analyses of Hebrew stress have proposed that the language may actually be trochaic (see Becker 2003). All things considered, then, there seems to be little evidence for a Trochaic Bias.

In fact, there is some evidence *against* it from both trochaic and iambic languages: Hochberg (1988), for example, demonstrates that children have a “neutral start” in acquiring Spanish stress, meaning that, at the beginning, they produce many iambic, as well as trochaic, profiled words; that is, they do not have a bias towards trochaic stress. This is despite the fact that Spanish is analyzed as trochaic by most researchers (see e.g. Roca 1988, 1991; Harris 1991, 1992). Similarly, according to Prieto’s (2006) study, children have a neutral start in learning Catalan, a language that is usually analyzed as trochaic (Serra 1996, Bonet & Lloret 1998), but Catalan stress is contrastive, and is, thus, also compatible with an iambic analysis (Wheeler 2004).

The so-called bias that is demonstrated for English- and Dutch-learning children should, then, come from the rhythmic properties of the input children receive in learning these languages. Once they are subject to enough input from the target trochaic language, they set the value of the Foot-Type parameter, accordingly, to *Trochaic*. If so, even for English-learning children, at very early stages, there may be no preference for trochaic feet. This prediction seems to hold true: Vihman, DePaolis & Davis (1998) demonstrated, for English-learning children, that during the babbling stage, they produce an equal number of trochaic and iambic patterns in their bisyllabic utterances (see also Klein 1984 for similar results).

Conversely, if there is no "Trochaic Bias," children learning languages that are not trochaic should not start with trochaic utterances. Children learning iambic languages should, for example, favor iambs to trochees. This prediction, too, is borne out, though most of the evidence comes from the acquisition of French (e.g. Paradis, Petitclerc & Genesee 1997, Vihman et al. 1998, Archibald & Carson 2000, Goad & Buckley 2006, Rose & Champdoizeau 2007, Goad & Prévost 2011) and Turkish (Aksu-Koç & Slobin 1985), two languages that I have argued have no foot structure. So lack of a trochaic bias in learners of these languages might also be attributed to the very proposal made in this thesis that these languages are footless.[10] There are, though, two other studies from languages that have been argued to be iambic in the literature: Yucatec Mayan (Archibald 1996)

[10] The Vihman et al. study found that learners of French, unlike learners of English in the same study, overwhelmingly produced patterns consistent with an "iambic" analysis (even though they, too, were at the babbling stage). This, I believe, can be attributed to the proposal made here that French is footless, and as argued in this thesis, footless utterances are the default option, instead of their footed counterparts, whether trochaic or iambic. It makes sense, then, that while learners of English were in the process of setting the (initially open) Foot-Type parameter to *Trochaic* (and before doing so producing an equal number of utterances that are consistent with a trochaic or iambic analysis), learners of French had already been producing the default footless utterances made available by UG. (Vihman et al., however, attribute this asymmetry to the fact that French "stress" is rather regular as opposed to English.)

and Northern East Cree (Swain 2008). Learners of these languages produced utterances that were consistent with an iambic analysis. Out of these, the latter, Northern East Cree, seems to be truly an iambic language (i.e. probably not footless), as it demonstrates such properties as boundedness and quantity-sensitivity (see e.g. Dyck, Brittain & MacKenzie 2006 and Wood 2006), as with other languages from the Algonquian family, e.g. Ojibwa (Bloomfield 1957; Piggott 1980, 1983). The point would, of course, have been clearer if there had been more studies with learners of indisputably iambic languages. However, even the results of studies with Spanish- and Catalan-learning children, as well as learners of English at the babbling stage, should suffice to be evidence *against* the default status of trochaic stress, as they demonstrate that children do not necessarily start with trochees even when learning a trochaic language.

4.3.3.4.2 More from L1 acquisition on default vs. open settings

Little research has been done on the L1 acquisition of other Left/Right parameters. Fikkert (1994), however, demonstrates that when children learning Dutch start producing words composed of more than one foot, they produce equal stress on the head of each foot. I interpret this observation as lack of a default option for the End-Rule-Left/Right parameter; the parameter had probably not yet been set to either value, and was still open, as was argued here to hold for the initial setting of all parameters that result from having foot structure.

I expect all Left/Right parameters in (2) to behave in the same way. As argued above, there is no principled reason why, for these parameters, UG should make one value the default option, given that positive evidence is *equally* available in both directions. In fact, having a default value for these parameters would not only not help an L1 learner in the acquisition process, it would, rather, serve to increase the burden on the learner since a previously assumed (default) analysis would, then, need to be altered based on positive evidence.

Unfortunately, Yes/No parameters have not received the same attention in L1 acquisition research as Left/Right parameters have. Most of the arguments given above for the marked status of the *Yes* setting have come, therefore, from the formal assumptions about the comparative robustness of input. There is, however, some evidence in support of these arguments that indirectly comes from the literature on the Trochaic Bias Hypothesis.

First, virtually none of the learners tested in these studies showed extrametricality, even when learning a language with extrametrical final syllables. Kehoe (1998), for example, found that target English nouns of the shape (H́L)<H> were often produced with final stress by children, which suggests that the *Yes* value of this parameter had not yet been set. This is evidence that the *Yes* setting is more marked, since errors, in L1 acquisition, are usually made only by children learning a language with the marked value (see e.g. Fikkert 1994). Therefore, errors should take the form of the unmarked or the open value of a parameter (though, here, no activation and the unmarked *No* value, on the surface, yield the same outputs).

Second, one type of evidence that is often cited as support for the Trochaic Bias Hypothesis is that target LH́ forms such as *balloon* which have final stress are often produced as ĹH (with initial stress) by learners of both English and Dutch (see e.g. Fikkert 1994, Kehoe 1998). The problem with taking these facts as evidence for a trochaic bias is that the change from final to initial stress in such words does not turn them into trochaic (they already are trochaic), so the behavior cannot have been caused by a preference for trochaic feet. Rather, the change potentially signifies that children have a preference for weight-insensitive grammars, which is expected on the current account, since Weight-Sensitivity is a Yes/No parameter, unlike Foot-Type, and weight-sensitive grammars have the marked setting of this parameter. Weight-sensitive systems, therefore, should arise later only on the basis of positive evidence.

In sum, as both the formal arguments about the nature of the input and the findings of L1 acquisition literature indicate, there is no reason, for Left-Right parameters, to have a value that is more unmarked than the other, whereas there is good reason to make such an assumption for Yes/No parameters. In either case, all parameters that follow from having a foot are initially open. Whereas open means, as far as L1 acquisition is concerned, a neutral start for Left/Right parameters (one that favors neither Left nor Right), it is empirically equivalent to the *No* setting for (most) Yes/No parameters. The following section, Section 4.3.4, summarizes the current account.

4.3.4 Summary: The PAPH in a nutshell

The main theoretical assumptions behind the PAPH are summarized in (4) below, followed by a summary of the three main components of the PAPH in (5).

(4) Main theoretical assumptions:

a. The Foot is not a universal constituent of the Prosodic Hierarchy, but its presence/absence is parametrically determined.

b. Whereas parameters which involve projection of new constituents are pre-set to a default value by UG (e.g. the Footed-Yes/No parameter in (1), which is initially set to *No*), those which act on the constituents that have been projected are initially open, and are, then, set to the correct value based on positive evidence (i.e. all the parameters in (2)).

c. For some of the parameters that are initially open, i.e. the Yes/No parameters in (2), markedness can be invoked, since, for certain settings of these parameters (usually the *Yes* setting), the positive evidence available is more robust (and unambiguous) than it is for the other setting. For others, i.e. the Left/Right parameters in (2), both values are equally unmarked, and the positive evidence available is equally robust.

The predictions of the PAPH, given these assumptions and given (2), are summarized in (5) below:

(5) Summary of the three main components of the PAPH:

a. Once a prosodic constituent is projected in an L1, it is impossible to rid the grammar of it. Thus, if the L1 has foot structure, learners of a footless L2 will not be able to expunge it from their grammar. In the current case, L1 English learners of L2 Turkish will never be able to rid their grammar of the Foot, and, as a result, will never have the target-like Turkish prosody in (1b.ii) (for regular stress), unlike French-speaking learners who begin the L2 acquisition process with (1b.ii).

b. It is impossible to deactivate a parameter altogether. Thus, it is also impossible to deactivate the parameters in (2). In the current case, English-speaking learners of Turkish will not only not be able to expunge the Foot from their grammar, but they will also not be able to deactivate parameters that act on the Foot.

c. Parameter resetting is possible when positive evidence is available. In the current case, in the absence of being able to expunge the Foot from their grammar or deactivate parameters that act on the Foot, in order to sound more target-like, English-speaking learners of Turkish will resort to other UG-constrained options, and *reset* the parameters under (2) (unlike the parameter in (1)).

   i. Resetting terminal parameters is easier than parameters which have other parameters dependent on them. That is, resetting a parameter with embedding is costly, though not impossible.

   ii. For all parameters with *Yes/No* settings, whether embedded or not, it is easier to move from the *No* value of a parameter to the *Yes* value than vice versa.

   iii. For parameters with *Left*/*Right* values, it is equally easy/difficult to go from *Left* to *Right* or *Right* to *Left*.

In Section 4.4, I will illustrate, more concretely, some of the possible learning paths (5) predicts for learners of Turkish, demonstrating which options they are hypothesized to attempt first and which options later in the acquisition process with respect to changing the values of the parameters in (2).

4.4 Predictions

Given the linguistic properties of English, French and Turkish (see Chapters 2 and

3), and given the Prosodic Acquisition Path Hypothesis (PAPH) proposed in this chapter, certain predictions follow for L1 English- and French-speaking learners of L2 Turkish. These predictions will be the primary focus of this section. Before moving on to the predictions, a summary of the representations for the three languages that are under investigation here is provided below (see Chapters 2 and 3 for detailed discussion).

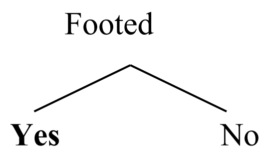
4.4.1 L1 representations of the three languages

The trees in (6) to (9), below, provide a schematic representation of the parameter settings for each of the three languages that are under focus. The specific options chosen by a given grammar are provided in boldface; for example, in (6a) below, the option *Yes* is bolded under Footed, for this is the option taken by English, a language with foot structure. If nothing is bolded under a node (as with e.g. Directionality for Turkish exceptional stress), this means that it is an open parameter.

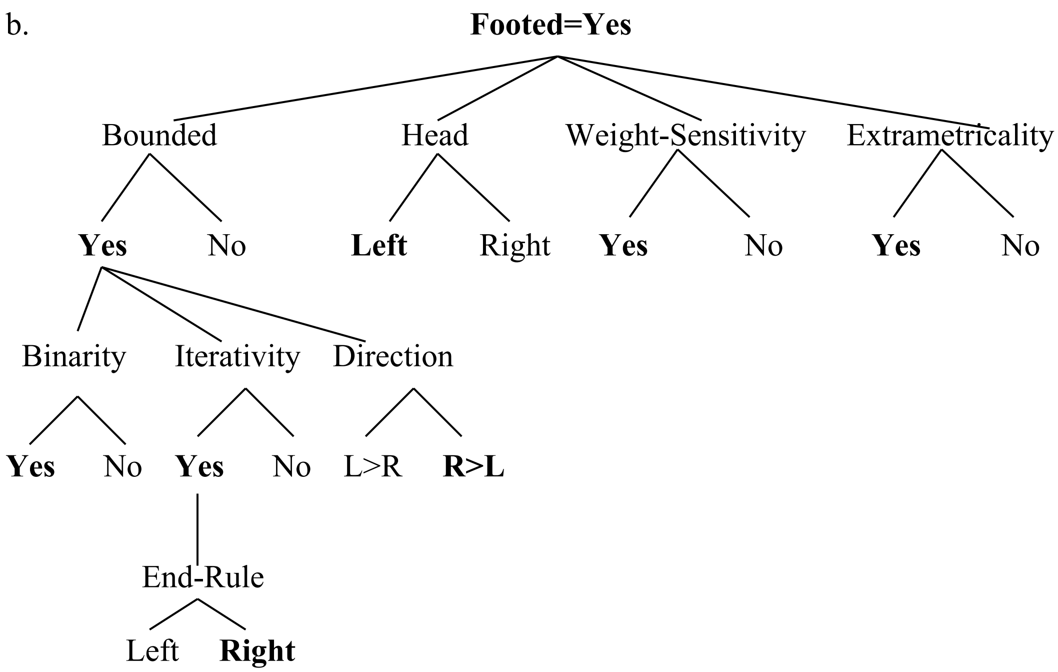
We start with English. As was explained in Chapter 3, every content word has to have at least one foot in English, and the language is, thus, a footed language (see (6a)). Further, as indicated in (6b), feet in English are weight-sensitive, binary and left-headed (moraic trochees). Foot construction is right-to-left, but the rightmost syllable is extraprosodic; it is, therefore, ignored for the purposes of foot construction, and Extrametricality is, thus, set to *Yes*. Feet are iterative in English; as long as a word is long enough, there will be multiple binary feet, out of which the rightmost will be the head of the PWd, since End-Rule is set to *Right*, and the head of this foot will, thus, bear primary stress.

(6) English stress

a.



b.



French, on the other hand, does not require words to have feet. As discussed in Chapter 3, French has no word-level prominence (Dell 1984, Ladd 1996, Jun & Fougeron 2000), and according to some researchers (e.g. Beckman 1986), only demarcative cues to the edges of words or phrases, rather than "stress." As such, and given the formal evidence provided in Chapter 2 and 3 for the parametric status of the Foot, I analyze French as footless, as represented in (7) (see Chapter 3.1 for a more detailed analysis). And since Footed=No in French, all other parameters under Footed=Yes (see (6b) above) are open.

(7) French stress

Footed

Yes **No**

As with French, and as was proposed in Chapter 2, Turkish regular "stress" is footless. The footedness parameter is, thus, set to *No* in Turkish:

(8) Turkish regular stress

Footed

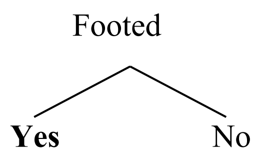
Yes **No**

Though both French and Turkish are footless (see (7) and (8)), the two languages differ in that whereas the domain of prominence is the PPh in French, it is the PWd in Turkish.

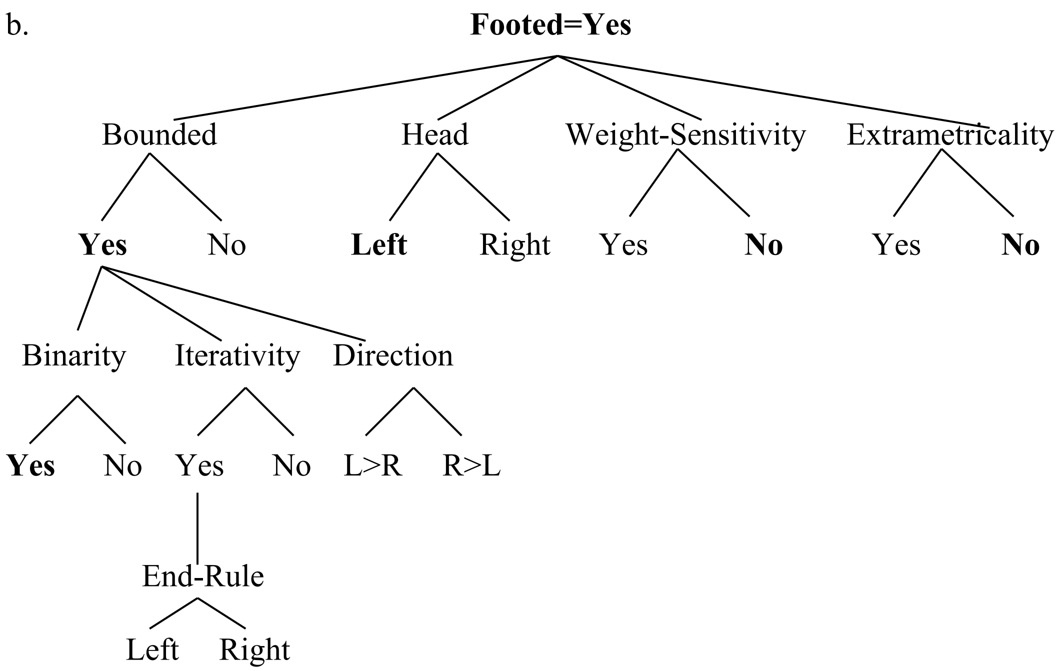
As opposed to regular stress, exceptional stress, in Turkish, involves foot structure, though the foot in this case, unlike in English, is not assigned by the grammar, but, rather, is encoded in the input, as was proposed in Chapter 2. It is, thus, not the result of the same parameter that leads to footing in English (i.e. Footed=Yes), but is, rather, realized on the surface through Faithfulness to underlying foot edges in the input. So (9a) does not mean that feet are assigned by the grammar in the case of exceptional stress in Turkish, unless, of course, a cophonologies account is adopted like that of Inkelas & Orgun (1998) (see Chapter 2). The choice between the two accounts, i.e. whether foot structure is present in the input or whether it is assigned by a separate cophonology/grammar, does not make any difference for the purposes of the PAPH; the critical thing here is that regular prominence in Turkish is footless.

(9) Turkish exceptional stress

a.



b.



4.4.2 Predictions

The universal predictions of the PAPH, predictions that are expected to hold true for all L1-L2 pairings, were presented in Section 4.3 above (see the summary in (5)), along with an in-depth examination of the proposal and evidence to support it. The current section covers more specific predictions, in the context of L1 English and L1 French learners of L2 Turkish, the populations tested in this thesis.

The predictions differ considerably for the two groups of learners concerning the acquisition of Turkish regular “stress”: In most general terms, first, L1 French learners of L2 Turkish are expected to attain target-like representations; in fact, they should make correct assumptions from the very beginning of the acquisition process since, as I have argued, the only relevant parameter, Footed-Yes/No, is set alike, i.e. to *No* in both languages; both Turkish regular stress and French stress are footless, intonational prominence. Of course, the domain of intonational prominence is different in the two languages; whereas the PWd is the domain of prominence in Turkish, it is the PPh in French. Clearly, then, French-speaking learners of Turkish need to learn that the domain of prominence is different in Turkish than in their L1 grammar. This does not, however, involve expunging a prosodic constituent from the grammar; acquisition should, thus, be possible. For L1 English learners of L2 Turkish, on the other hand, native-like attainment would involve ridding the grammar of a prosodic constituent, which is hypothesized to be impossible on the PAPH. L1 English learners of L2 Turkish will, therefore, never be able to reach the appropriate representations for regular stress in this language.

The hypothesis that English-speaking learners of Turkish will never reach target-like representations of Turkish regular stress does not mean that they will always use their L1 representations: As per (5c), they are expected to consider a variety of UG-constrained options, and in doing so, they should initially resort to easier options rather than more difficult ones (see (5c.i) through (5c.iii)). For example, in learning Turkish regular stress, English-speaking learners should first reset a terminal parameter like Extrametricality or Headedness, rather than a parameter with embedding like Iterativity.

4.4.2.1 Potential strategies for acquiring Turkish regular stress

I examine below some of the possible routes that French- vs. English-speaking learners might take, with a focus on English-speaking learners, for they are the ones expected to have persistent problems, and are predicted to show a variety of different behaviors depending on factors such as level of proficiency in Turkish. We start with the French-speaking learners.

4.4.2.1.1 French-speaking learners

Since French is assumed, in this thesis, to be a footless language like Turkish (see Chapter 3), French-speaking learners of Turkish are hypothesized not to have any problems with producing footless Turkish words. That is, they should be able to make the final syllables of Turkish words prominent without placing greater intensity or duration on these syllables. Further, irrespective of the length of words, they should be able to have only one syllable, the final one, prominent within a word, and thus, not have secondary stress.

French learners might, though, demonstrate some non-target-like behavior in terms of the domain and phonetic representation of final prominence, for final prominence in French is generally assumed to fall on the final syllable of a PPh, not a PWd, and is cued not only by a slight F0 rise, as with Turkish, but also by longer duration (see Chapter 3). For this reason, it is possible that French learners of Turkish will lengthen final syllables of Turkish words or phrases. This, though, is not expected to happen all the time, for differential cues at the phonetic level are expected to be acquirable (unlike losing a prosodic constituent). It is, thus, possible that we might see French learners fluctuate, i.e. learners may have final prominence cued sometimes with longer duration, sometimes without.

In order to avoid the confounding effects of the PPh-final prominence in French, as well as for other reasons to be covered in the next chapter (Methodology), the experimental words were placed in a position other than the PPh-final position. Because of this, French-speaking learners might produce Turkish experimental words in target-like fashion, including the phonetic cues. Since duration for words other than the PPh-final PWd is optional at best in French (see Chapter 3), French is essentially like Turkish in every respect at the word level, and French-speaking learners of Turkish should, then, have no difficulties in acquiring the acoustic cues of Turkish word-level prosody.

4.4.2.1.2 English-speaking learners

In the case of English-speaking learners, on the other hand, target-like behavior is not expected at the structural level. That is, even at advanced levels, these learners are expected to retain foot structure, despite evidence in the input that Turkish does not have foot structure.

That English learners of Turkish will never attain target-like representations for Turkish regular stress does not, as mentioned above, mean that they will always use the L1 parameter settings in their L2 grammar. Instead, depending on their proficiency, they are expected to entertain a variety of UG-constrained options, which will make their interlanguage sound, on the surface, more and more target-like (though never actually being structurally target-like). And in doing so, they should initially resort to options that are easier (i.e. given (5)).

I cover below some of the possible options/strategies[11] that L1 English learners of L2 Turkish might employ with respect to regular stress in the absence of being able to expunge the Foot from their grammar. These strategies should not be interpreted as a strict acquisition order that would hold true for every speaker; what is important here is that the first strategy, the easiest one, requires one terminal parameter to be reset towards accommodating the input; the second requires two, and the third requires three. As for the fourth, it resets an embedded parameter, in addition to resetting terminal parameters that are dependent on it. That is, a minimum number of changes to the L1 parameter settings is predicted initially, as well as changes that are less costly (i.e. changes to terminal parameters, rather than parameters with embeddings). An acquisition order along these lines is predicted, though learners will not necessarily go through these exact steps in acquiring every language: It could be that an English learner of a language other than Turkish will initially reset another terminal parameter at Stage 1, such as Directionality, instead of the one provided below, if resetting that parameter better accounts for the L2 input. In any case, though, strategies that serve to accommodate the L2 input will, at all stages, be employed, which, for L2 Turkish, means that strategies that serve to place prominence more often on the word-final syllable will be employed, but without ridding the grammar of the Foot, for that is hypothesized to be impossible.

[11] The word "strategy" is used for ease of exposition in this thesis. "Strategy" is not intended to imply conscious choices on the part of learners. Rather, "strategies" represent different ways of restructuring the interlanguage grammar on the basis of the input (word-finally prominent Turkish words) which is mistakenly represented, in L2 learners' output, with foot structure.

I use three bisyllabic and three trisyllabic words as examples (taken from the actual test items) throughout this section in demonstrating learners' predicted outputs under each strategy: Bisyllabic words include *kedi* "cat," *çatal* "fork," and *elma* "apple." These words represent sequences of Light-Light (LL), Light-Heavy (LH), and Heavy-Light (HL) syllables respectively, based on the weight these syllables would be assigned by the English grammar (since Turkish is not weight-sensitive). As for trisyllabic words, they include *araba* "car," tebeşir "chalk," and *yumurta* "egg." These words respectively represent LLL, LLH and LHL syllable structures.[12]

Remember at this point that Turkish regular stress (or rather final prominence) falls on the last syllable of a word, and that neither vowel length nor the presence of a coda consonant has an effect on the location of stress.[13] For example, for the word *yumurta*, stress does not fall on the penultimate syllable, though it has a coda, and is thus potentially heavy. In English, on the other hand, both long vowels and codas contribute weight; thus, both attract stress, English being a weight-sensitive language. That is, L vs. H is based on the English grammar.

The stage-like behavior that is predicted to occur is illustrated as Stage Ø through Stage 5 below. Both location of stress (final or not) and Iterativity, the two surface correlates of non-native prosody, are considered.

---

[12] Note that these six word types are used in this section only for expository purposes; as will be seen in the next chapter, the experiment includes all possible L and H combinations with two- and three-syllable words (i.e. totaling 12 possibilities). The point about the sections to follow is only to show, for a subset of words, what kind of effects one gets with different parameter settings for various parameters.

[13] Note though that none of the six example words ends in a long vowel, nor are any such words used in the experiment. Although there are long vowels in Turkish (and thus words ending in long vowels), these are very few and are restricted to borrowings. Therefore, being able to stress the final syllables of words ending in long vowels will not result in a remarkable increase in success rate.

Stage Ø: Full Transfer:

Assuming that the initial state of L2 acquisition is the L1 grammar (White 1989b, Schwartz & Sprouse 1996), beginning level English learners of Turkish should transfer L1 settings of *all* the parameters in (6), and thus, construct right to left, iterative, left-headed, bounded, binary feet with End-Rule set to *Right* and Extrametricality to *Yes*. Table (10) below exemplifies this with the bisyllabic and trisyllabic words we will be using as examples throughout this section. Note that since, under this option, the final syllable is always extrametrical, it never gets stressed, and the stress pattern of interlanguage words is, therefore, never target-like:[14]

(10) Stage Ø exemplified

				Success rate	
Target words	**L1 (English)**	**Interlanguage**	**L2 (Turkish)**	**Fin. Str.**	**Non-iter.**
Bisyllabic words:					
a. LL kedi “cat”	[(ké)<di>]	[(ké)<di>]	[kedi]	NO	YES
b. LH *çatal “fork”*	[(çá)<tal>]	[(çá)<tal>]	[çatal]	NO	YES
c. HL elma “apple”	[(él)<ma>]	[(él)<ma>]	[elma]	NO	YES
Trisyllabic words:					
d. LLL araba “cat”	[(ára)<ba>]	[(ára)<ba>]	[araba]	NO	YES
e. LLH tebeşir “chalk”	[(tébe)<şir>]	[(tébe)<şir>]	[tebeşir]	NO	YES
f. LHL yumurta “egg”	[yu(múr)<ta>]	[yu(múr)<ta>]	[yumurta]	NO	YES
				0%	**100%**

[14] Some of the feet here violate Binarity (i.e. (10a) and (10b)). Depending on whether Binarity or Extrametricality is a more important requirement to satisfy for a given learner, it is possible that Extrametricality will be violated for (10a) and (10b) in order to satisfy Binarity. For expository purposes, I do not consider this option. The alternative would not affect the location of stress on (10a) (i.e. [(kédi)]), but it would on (10b) (i.e. [(ça(tál)]), unless the final V in (10b) is reduced to schwa, which is weightless in many languages including English. The two different ways of satisfying these parameters will be considered in more detail in Chapter 6: Results & Discussion.

The first column in this table provides the target words. The second column shows how L1 English would represent these words, if they were words in English. The third column gives the predicted Interlanguage representations, which are the same as the L1 representations at this stage. The fourth column provides the L2 Turkish (target) representations of these forms, which are all footless. Finally, the last two columns, "Final stress" and "Non-iterative," demonstrate how successful[15] a learner at this stage would be with respect to placing prominence on the final syllable of each word type and with respect to not revealing problems with Iterativity. A suggested percentage of overall success is also provided at the bottom of these two columns.

For expository purposes, each word profile is treated equally in calculating success rate; that is, the relative frequency of a given word shape (e.g. LL) or of individual words within a given word shape (e.g. [kedi] within LL) is not factored into the calculations. So, for final stress, for example, two correct representations (indicated as *Yes*) and four incorrect representations (indicated as *No*) would yield a 33% success rate (i.e. 33% *Yes*).

In this case, success rate on final stress is 0%, for learners using this strategy will never stress the final syllable of any of the forms in (10). On the other hand, success rate on Iterativity is 100%, for there is no syllable with secondary stress. Iterativity would also be non-target-like at this stage, for it is set to *Yes* in English, unlike in Turkish, though, for the words in (10), it is vacuously satisfied since none of these words have enough moras to make two binary feet, since the last syllable is treated as extrametrical. For longer words (and three-syllable words

[15] This is not actual success; 'success' here means correctly being able to put prominence on the final syllable and only on this syllable. See Strategy 1 below for further discussion of what is meant by "success" in this chapter.

that are HHH, HHL, etc.) though, the problem will, of course, surface. See below for possible L1 effects of Iterativity on words of this length.

Strategy 1: Reset Extrametricality from 'Yes' to 'No'

If the learner resets the Extrametricality parameter from *Yes* to *No*, and keeps all other English parameter values as they are in the L1, he or she would correctly produce some forms with final stress, as a result of this single change in the grammar.

Under this strategy, we would expect the learner to still construct right-to-left, weight-sensitive, binary trochees. And since the learner's trochees will be weight-sensitive, he or she will stress the final syllable of all words that end in a consonant, for both codas (and long vowels) are moraic in the L1.

For final prominence, this would lead to a 33% "success" rate, given (only) the six types of example words under consideration here (see table (11)). As mentioned above, "success" here is defined, for all strategies under consideration, as correctly being able to put greater prominence on the final syllable than on other syllables in the word; in other words, it does not mean "structurally target-like." 33% in this case shows the effect of a change in the value of a single parameter, but while this change improves final stress, it comes at some cost as concerns Iterativity, since some words under this strategy (i.e. (11e)) have enough visible moras for the creation of more than one foot. Nevertheless, most of the words here are not long enough to let this problem be noticed, resulting in an 83% success rate for Iterativity.

(11) Strategy 1 exemplified

			Success rate	
L1 (English)	**Interlanguage**	**L2 (Turkish)**	**Fin. Str.**	**Non-iter.**
Bisyllabic words:				
a. [(ké)<di>]	[(kédi)]	[kedi]	NO	YES
b. [(çá)<tal>]	[ça(tál)]	[çatal]	YES	YES
c. [(él)<ma>]	[(él)ma]	[elma]	NO	YES
Trisyllabic words:				
d. [(ára)<ba>]	[a(rába)]	[araba]	NO	YES
e. [(tébe)<şir>]	[(tèbe)(şír)]	[tebeşir]	YES	NO
f. [yu(múr)<ta>]	[yu(múr)ta]	[yumurta]	NO	YES
			33%	**83%**

Remember at this point that such a learner could possibly also reset Iterativity from *Yes* to *No*, and attain full success in that domain, but I assume, for three reasons, that this would not happen until later. One, resetting Iterativity would be quite costly, given (5), since the parameters dependent on Iterativity (i.e. those below it in (2)) would also be affected by such a change.[16] Two, such a costly change would not help the learner a lot since problems with Iterativity do not become noticeable unless the word is like (11e) or is one with at least four moras (HH, HLL, etc). Thus, resetting Iterativity would likely not be an economical choice for a beginner learner to employ. Three, not being able to get rid of Iterativity would not have a negative effect on final prominence, because, out of all the feet present in a word, the learner will still choose the rightmost one

[16] One might argue that such a learner can, instead, reset End-Rule to *No*, which is a terminal parameter under Iterativity, and, thus, have no Iterativity. This is not possible for two reasons. First, since End-Rule is a Left/Right parameter, one cannot simply reset it to *No*; its effect cannot be removed unless it is deactivated, which is hypothesized to be impossible, given (5b). Second, even if deactivation of End-Rule turned out to be possible, since there are iterative systems with no End-Rule, e.g. Tübatülabal (e.g. Hayes 1981, Prince 1983), even if End-Rule was, somehow, deactivated, Iterativity would still not be irrelevant.

as the most prominent (as shown in (11e)), given the End-Rule-*Right* setting he or she would be transferring from the L1.

In sum, this single strategy, resetting of Extrametricality from *Yes* to *No*, will help learners place prominence, one third of the time, on the final syllable (without usually revealing problems with Iterativity), making it an economical choice on the part of learners.

Strategy 2: Reset Extrametricality (Strategy 1) together with word-final vowel-lengthening

The word types that were problematic under Strategy 1 were those ending in a final light (CV) syllable. If, in addition to resetting Extrametricality, learners lengthen the final syllable of any word ending in a vowel, thereby turning light syllables into heavy, final stress will result 100% of the time. Note that this is not an entirely new strategy, for, in terms of the parameters in (2), the same changes are made as in Strategy 1 above. The only thing new here is that the final syllable is *incorrectly* lengthened to make it stressable.[17]

By using this strategy, the learner will be able to foot not only word-final syllables that end in a coda consonant (as in Strategy 1 above), but also those ending in a vowel, for every word-final vowel will be produced as long, and will, thus, contain two moras, thereby making it possible for the word-final syllable to constitute a binary trochaic foot on its own. Note, however, that in addition to the cost of incorrectly lengthening word-final vowels, this change leads to a higher

[17] Implicit behind this is the assumption that learners will correctly *perceive* that the final syllable in Turkish is prominent but short. They could, of course, perceive prominent syllables as heavy, an option I do not consider here. Examination of perceptual factors is left to future research.

number of observable problems with Iterativity, for it increases the number of syllables that can be contained within binary feet, thereby resulting in more syllables that are stressed within a word. Nevertheless, given how much it increases the (surface) success rate for final stress/prominence, I expect this to be a highly probable possibility to be used by learners, and one that might persist even at advanced levels of proficiency. Examine (12) below, which demonstrates the grammar at this stage, using our six example words:

(12) Strategy 2 exemplified

			Success rate	
L1 (English)	**Interlanguage**	**L2 (Turkish)**	**Fin. Str.**	**Non-iter.**
Bisyllabic words:				
a. [(ké)<di>]	[ke(dí:)]	[kedi]	YES	YES
b. [(çá)<tal>]	[ça(tál)]	[çatal]	YES	YES
c. [(él)<ma>]	[(èl)(má:)]	[elma]	YES	NO
Trisyllabic words:				
d. [(ára)<ba>]	[(àra)(bá:)]	[araba]	YES	NO
e. [(tébe)<şir>]	[(tèbe)(şír)]	[tebeşir]	YES	NO
f. [yu(múr)<ta>]	[yu(múr)(tá:)]	[yumurta]	YES	NO
			100%	**33%**

Strategy 3: Reset Extrametricality (Strategy 1) and Head from 'Left' to 'Right'

The preceding strategy to obtain final stress required lengthening final vowels, in addition to resetting Extrametricality. Another way to achieve this effect would be to change trochees into iambs, and to keep the settings of all other parameters as in Strategy 1. Although, by itself, this would result in less success in final stress (67% of the time, see table (13)), the advantage of this strategy is that there needn't be a Faithfulness violation for final vowels, with the additional benefit that there are fewer noticeable Iterativity violations (83% non-iterative), leading to higher overall success. Table (13) below shows what such a grammar would look like for the six example words we have been using so far, together with overall success rate:

(13) Strategy 3 exemplified

			Success rate	
L1 (English)	**Interlanguage**	**L2 (Turkish)**	**Fin. Str.**	**Non-iter.**
Bisyllabic words:				
a. [(ké)<di>]	[(kedí)]	[kedi]	YES	YES
b. [(çá)<tal>]	[(çatál)]	[çatal]	YES	YES
c. [(él)<ma>]	[(él)ma]	[elma]	NO	YES
Trisyllabic words:				
d. [(ára)<ba>]	[a(rabá)]	[araba]	YES	YES
e. [(tébe)<şir>]	[(tebè)(şír)]	[tebeşir]	YES	NO
f. [yu(múr)<ta>]	[(yumúr)ta]	[yumurta]	NO	YES
			67%	**83%**

This analysis is one that is relatively easy to arrive at under the PAPH: The learner must reset *two* existing terminal parameters, but he or she does not have to make any previously set parameters (de facto) inactive.[18] To see this more clearly, examine (2): Both the Extrametricality parameter and the Head-Left/Right are terminal in the tree.

[18] It is not clear though if the learner would really be able to reach an iambic analysis like this one for Turkish regular stress, for Turkish irregular stress – which is trochaic – might potentially complicate things, assuming that the learner at this stage understands how exceptional stress works, such that the learner might decide not to construct iambs since that would not, then, be able to capture the obvious trochees in the language. In other words, having two different types of feet in the same language is questionable at best, but it has been proposed in the literature on Turkish (Inkelas 1999, Inkelas & Orgun 1998).

Strategy 4: Reset Extrametricality and Head (Strategy 3) plus Weight-Sensitivity from 'Yes' to 'No'

The problem with the previous stage was with final Heavy-Light (HL) sequences since, given Weight-Sensitivity, these are stressed on the H, even in an iambic grammar. If, in addition to resetting trochees to iambs, the learner resets Weight-Sensitivity from *Yes* to *No* (i.e. *three* changes in the grammar, all terminal parameters), success with final prominence, as well as Iterativity, would increase up to 100%. Every word-final syllable, irrespective of the corresponding weight in the L1, will then be the head of an iambic foot (ensuring final stress), and there will not be enough syllables left to create more than one binary foot (ensuring lack of surface Iterativity). Examine (14):

(14) Strategy 4 exemplified

			Success rate	
L1 (English)	**Interlanguage**	**L2 (Turkish)**	**Fin. Str.**	**Non-iter.**
Bisyllabic words:				
a. [(ké)<di>]	[(kedí)]	[kedi]	YES	YES
b. [(çá)<tal>]	[(çatál)]	[çatal]	YES	YES
c. [(él)<ma>]	[(elmá)]	[elma]	YES	YES
Trisyllabic words:				
d. [(ára)<ba>]	[a(rabá)]	[araba]	YES	YES
e. [(tébe)<şir>]	[te(beşír)]	[tebeşir]	YES	YES
f. [yu(múr)<ta>]	[yu(murtá)]	[yumurta]	YES	YES
			100%	**100%**

This does not, of course, mean that the learner would not have any problems at all with Iterativity: it is just that these problems would not be revealed for words that include up to three syllables. Problems would, of course, be disclosed in longer words (e.g. resulting in forms such as [(LL̀)(LĹ)]). Nevertheless, since much of the L2 Turkish lexicon is composed of words that include up to three syllables, the learner employing this strategy will, much of the time, sound native-like with respect to both how prominence is placed on the word-final syllable more often and how rarely syllables with secondary stress are produced.

Note, though, that it is not clear, given certain universal principles, if a weight-insensitive iambic grammar such as this one is possible. While even parses, of the form (13a) or (13d) of Stage 3 above (i.e. (LĹ)), have been attested in weight-sensitive iambic languages (see e.g. Gordon 2002, Everett 2003), many researchers concur that weight-insensitive iambic grammars with parses such as (HĹ) (e.g. (14c) and (14f)) and (HH́), where a heavy syllable is in foot-dependent position, do not exist (see e.g. Hayes 1985, 1987, 1995; McCarthy & Prince 1986, 1993, 1995; Prince 1991, among others). While it is possible that codas do not bear weight in such a grammar, and thus, that these forms do not effectively contain any heavy syllables, and, therefore, involve even feet (LĹ), iambic languages that do not strive to build uneven iambs (e.g. through iambic lengthening) are rare (Hayes 1987, 1995). Given this, it is not clear how likely a learner would be to employ a strategy like this, if interlanguages are natural languages, and follow tendencies observed in natural languages as we have argued here. A strategy like this is, thus, unlikely. It is, nevertheless, included here, because it is an option that is cognitively and pedagogically reasonable.

On the other hand, such a learner might, additionally, resort to 'iambic lengthening' thereby rendering the heads of iambic feet heavier than the dependent syllable, which would, of course, resolve the problem (e.g. (pará:), (çatá:l), a(rabá:)). In fact, such an option is not, technically, "additional," since, under this option, the interlanguage will be weight-sensitive, as in the L1.

Strategy 5: Reset Extrametricality, Head, Weight-Sensitivity (Strategy 4) plus Iterativity from 'Yes' to 'No'

Under this strategy, learners will be resetting *four* parameters: Extrametricality from *Yes* to *No*, Foot-Head from *Left* to *Right*, Weight-Sensitivity from *Yes* to *No* and, crucially, Iterativity, a *non*-terminal parameter, from *Yes* to *No*. Out of the four general strategies exemplified so far, this last one should be the most difficult to employ, requiring a change that involves a parameter with embedding (see (2)), which is hypothesized to be highly costly.

As such, a change in Iterativity alone is not expected by itself; it is a change that is predicted to come only after some of the easier changes have been made in the grammar; it would, thus, appear together with a set of other changes, as is exemplified in this strategy. This strategy should, therefore, be one that is resorted to only after other simpler strategies are rendered non-optimal by L2 learners in capturing final prominence and lack of secondary stress in Turkish. It is predicted that only advanced or near-native learners should consider this. (15) below illustrates what the interlanguage grammar would be like under this strategy:

(15) Strategy 5 exemplified

			Success rate	
L1 (English)	**Interlanguage**	**L2 (Turkish)**	**Fin. Str.**	**Non-iter.**
Bisyllabic words:				
a. [(ké)<di>]	[(kedí)]	[kedi]	YES	YES
b. [(çá)<tal>]	[(çatál)]	[çatal]	YES	YES
c. [(él)<ma>]	[(elmá)]	[elma]	YES	YES
Trisyllabic words:				
d. [(ára)<ba>]	[a(rabá)]	[araba]	YES	YES
e. [(tébe)<şir>]	[te(beşír)]	[tebeşir]	YES	YES
f. yu(múr)<ta>]	[yu(murtá)]	[yumurta]	YES	YES
			100%	**100%**

Note that under this strategy, unlike strategies 1, 2, 3, and 4, learners would finally be able to correctly get rid of Iterativity altogether,[19] i.e. even for longer utterances, because there will be a single foot at the right edge for any given word. On the other hand, they would still not be able to rid the grammar of the Foot, and their outputs would, thus, still be different from the actual Turkish grammar in that the acoustic correlates of final prominence would include duration (and possibly intensity), in addition to F0.

In sum, this chapter has laid out the three main components of the PAPH, as summarized in (5) above, as well as outlining the specific predictions following from the PAPH in the context of L1 English- and French-speaking learners of L2 Turkish, the populations investigated in this thesis. These predictions will be tested via a semi-controlled production experiment. The methodology used in conducting the experiment is the subject of the next chapter, Chapter 5.

[19] Another strategy that gets rid of Iterativity altogether would, of course, be to reset Boundedness from *Yes* to *No*, instead of resetting Iterativity. Such a strategy would, however, be even more difficult to employ, for Boundedness has even more parameters dependent on it than Iterativity does in the tree in (2). Determining, based on an output form, which of the two strategies is being employed by a given learner is nearly impossible, however; nonetheless, structurally speaking, changing Boundedness from *Yes* to *No* (and keeping everything else the same as in Strategy 4) would result in Interlanguage representations such as (arabá), (tebeşír), (yumurtá) (compare these with the Interlanguage forms in (15) that result from a change in Iterativity).

Chapter 5: Methodology

In order to investigate the predictions of the PAPH (see Chapter 4), a semi-controlled production experiment was conducted with L1 English- and L1 French-speaking learners of L2 Turkish. This chapter starts with a summary of the hypotheses (Section 5.1), and then provides detailed information on the subjects (Section 5.2), materials and stimuli (Section 5.3), and procedures (Section 5.4) employed. I start with the hypotheses.

5.1 Hypotheses

According to the PAPH, (i) English-speaking learners will not be able to lose the Foot even at advanced levels whereas French-speaking learners will start with footless representations from the beginning of the acquisition process. (ii) In order to be able to produce words with final prominence, English-speaking learners will resort to resetting the parameter values in the parameter tree in (2) in Chapter 4 (parameters that act on the Foot). In doing so, they will show stage-like behavior, as illustrated in Section 4.4.2.1.2 of the previous chapter, and will, thus, initially reset terminal parameters. Only at advanced levels will they be able to reset parameters with embedding, such as Iterativity. (iii) The prediction that at least some English-speaking learners will be able to produce words with final stress does not mean that they will have target-like prosodic representations. Rather, they are predicted to still be using intensity and/or duration in addition to F0 in capturing final prominence, suggesting that the interlanguage grammar still has foot structure (as with all stages illustrated in Chapter 4.4.2.1.2), unlike the target grammar. (iv) Some French-speaking learners might also use duration as a cue for prominence, given that it accompanies prominence in the L1. This, though, does not necessarily implicate the presence of foot structure. It is, instead, indicative of transfer of the French PPh-level prominence rules into Turkish. However, given that duration in French is relevant for words in PPh-final position, and that, as we will see below, the experimental Turkish words were not in PPh-final position, word-final lengthening, in the case of French-speaking learners, is not expected, at least not to the same extent as English-speaking learners with iambic grammars.

The following section gives detailed information about the subjects, and the tests used in order to classify them into various proficiency levels.

5.2 Subjects

26 subjects participated in the experiments, 18 L1 English and 8 L1 French learners of L2 Turkish. 5 of the English- and 2 of the French-speaking subjects were later excluded since they were determined to be bilingual.[1] Data from the remaining 19 subjects, 13 near-monolingual English- and 6 near-monolingual French-speaking learners of Turkish were transcribed and analyzed. English-speaking subjects spoke dialects of North American English (Canadian or American). Four of the French-speaking subjects were speakers of Québec French, and two of European French.

[1] Only near-monolingual subjects were invited to participate in the experiments; however, 5 English and 2 French subjects were determined to be bilingual (or to have had another language spoken at home as a child) after completing the study, based on their answers to the background questionnaire that was used (more on this questionnaire below), and, in the case of the French subjects, also based on a proficiency test designed for this purpose (more on this below). These subjects' data have not, thus, been transcribed or analyzed, and they are not included among the 19 subjects to be reported on here.

Out of the 19 subjects whose data were analyzed, 5 of the English-speaking subjects and 1 of the French-speaking subjects were students who were, at the time, taking, or had recently taken McGill University's Turkish as a foreign language courses. Out of the remaining 13 subjects, 4 English- and 2 French-speaking subjects were recruited through Craigslist, 2 English subjects through McGill University's Classified Ads, and finally, 2 English and 3 French subjects though personal contacts in Montreal. All subjects had normal or corrected-to-normal vision and no hearing problems (according to self-report).

There was no attempt to recruit equal numbers of subjects at different proficiency levels due to the low number of potential subjects available. In order to obtain an independent measure of proficiency level in Turkish, the subjects were asked to complete two different proficiency tests, a cloze test to evaluate their morphosyntactic, semantic and discourse proficiency and a read-aloud task to evaluate their global phonological proficiency. The latter measure of proficiency was included, for using the cloze test alone would reveal nothing about their phonological proficiency.

Since no standardized proficiency test was found to exist for Turkish, in an effort to ensure validity and reliability, tests used by previous researchers working on L2 Turkish were examined, and Montrul's (1997) Turkish proficiency test was chosen. A multiple-choice version of this test was prepared and administered, with some modifications (see Appendix A). The resulting cloze test had a total of 30 items.

The read-aloud task, which was used to evaluate learners' phonological proficiency, consisted of a short story in Turkish (138 words) (see Appendix B). The story was based on an already-existing Turkish folk tale. Special attention was given, in the process of choosing and writing the story, to including both regularly- and exceptionally-stressed roots and affixes, as well as words employing a wide variety of segments and requiring application of several phonological rules, so that the task could reveal as much as possible about the learners' phonological grammars (see e.g. Akita 2006, 2007 for a similar procedure).

The results were recorded using Audacity, and the readings were, then, rated, on a scale of 1 to 7, by three native speakers of standard Turkish, 1 being least, and 7 being most native-like in terms of global accent. Also included among the L2 learners' readings were readings by 3 Turkish native speakers, as well as readings by 2 learners of Turkish who were not subjects in the current study (see below), totaling 24 readings to be rated (19 learners + 3 native speakers + 2 non-native non-subjects). The ratings were done in a pseudo-random order, starting with a reading by a non-subject beginner learner of Turkish, followed by a native Turkish speaker and another non-subject. That is, the target readings started with the 4th reading (unbeknownst to the raters). The readings of the two other native speakers were interspersed among the other readings. The inclusion of native speaker readings was done in order to help define the upper bound, thereby leading to more accurate ratings of the advanced learners (see White & Genessee 1996). The inclusion of non-native non-subjects at the beginning was to control the effects of just starting the rating process and also to help define the lower bound.

The raters were foreign language teachers who had taken courses both in linguistics and in language testing/evaluation (including a course on the teaching and testing of oral language skills). The ratings were averaged across the three raters.

In addition to the two L2 Turkish proficiency tests, there was an additional read-aloud task, in English, taken by the French-speaking subjects (see Appendix C for the text). This task aimed to spot (and exclude) those among them who were bilingual French/English speakers, since French-speaking learners were recruited in Montréal, a highly bilingual city. The task used the same methodology as the Turkish read-aloud task. To ensure objectivity, subjects' readings were rated by 3 independent native English-speaking evaluators who had extensive training in linguistics, including phonetics and phonology. All 3 raters were graduate students in linguistics. Also, as with the Turkish read-aloud task, to increase rater accuracy, French subjects' readings were randomized with readings from 2 native English speakers as well as 2 non-native non-subjects. The people who identified themselves as Anglophone were not given a French version of the test since almost none of them were from Québec,[2] and none of them attended French-speaking schools nor had parents who spoke French.

The subjects were also asked to complete a background questionnaire in their native language (see Appendices D & E, for the English and French background questionnaires respectively). Subjects who had one or two parents who spoke a language other than the native language they reported were excluded

[2] Most of the 13 English-speaking subjects were from the USA or from English-speaking Canadian provinces such as Ontario and British Columbia. Two of them reported being from Montréal, Québec, but were raised in English-speaking families and were educated in English, unlike the French-speaking Québécois subjects, some of whom had part of their education in English. Since it was not initially expected to have English-speaking subjects from Québec, a French version of the read-aloud task had not been prepared. Nevertheless, the two English-speaking subjects from Québec were not excluded, a decision made based on their reported level of proficiency in French, as well as education and native languages of family members. As for the two French-speaking subjects from France, they were also given the test in English, along with the Québécois subjects since it was already prepared.

from analysis, as well as learners who reported being bilingual or speaking more than one language at home as a child, and, in the case of French learners, those who demonstrated near-native proficiency on the English read-aloud task. 5 English and 2 French subjects were excluded for these reasons.

Overall proficiency scores were calculated, in percentage terms, by adding the scores of the two proficiency tests together, the cloze test and the read-aloud task. Each test contributed equally. Based on the overall results, the subjects were assigned to three proficiency levels: beginner, low intermediate and advanced. Mean scores (M) and ranges (R) are given in Table 5.1 for both proficiency tests, as well as the overall proficiency.

Table 5.1 Results of the proficiency tests (in percentage)

Proficiency	**cloze test**		**read-aloud task**		**overall proficiency**	
L1 English (n=13)	**M**	**R**	**M**	**R**	**M**	**R**
Beginner (n=2)	26.67	23.33-30.00	16.66	14.28-19.04	21.66	18.80-24.52
Low Interm. (n=8)	45.83	33.33-60.00	42.32	33.33-52.38	44.07	33.33-56.19
Advanced (n=3)	83.33	76.66-90.00	69.84	57.14-80.94	76.58	70.23-85.47
L1 French (n=6)	**M**	**R**	**M**	**R**	**M**	**R**
Beginner (n=1)	30.00	30.00-30.00	23.81	23.81-23.81	26.91	26.91-26.91
Low Interm. (n=3)	53.33	40.00-63.33	50.79	47.61-52.38	52.06	46.19-55.47
Advanced (n=2)	79.99	73.33-86.66	66.66	66.66-66.66	73.33	69.99-76.66

Table 5.2 provides background information obtained through the background questionnaires.

Table 5.2: Background information

	Age at testing	Age of first exposure	Turkish instruction (in years)	Time in Turkey (in months)	Turkish use per week (in hours)
L1 English (n=13)	**M (SD) (R)**	**M (SD) (R)**	**M (SD) (R)**	**M (SD) (R)**	**M (SD) (R)**
Beginner (n=2)	30 (0) (30-30)	27 (0.71) (26-27)	0.15 (0.21) (0-0.3)	2 (2.83) (0-4)	0.75 (1.06) (0-1.5)
Low Inter. (n=8)	24.13 (4.49) (20-31)	20.88 (4.12) (16-27)	1.06 (0.68) (0-2)	1.88 (2.85) (0-8)	2.5 (0.93) (1-4)
Advanced (n=3)	31.67 (7.64) (25-40)	24.33 (2.31) (23-27)	1.17 (1.26) (0-2.5)	27 (29.55) (3-60)	9.67 (4.51) (5-14)
L1 French (n=6)	**M (SD) (R)**	**M (SD) (R)**	**M (SD) (R)**	**M (SD) (R)**	**M (SD) (R)**
Beginner (n=1)	28 (-) (28-28)	27 (-) (27-27)	1 (-) (1-1)	2 (-) (2-2)	1 (-) (1-1)
Low Inter. (n=3)	27 (4.36) (22-30)	25 (3.46) (21-27)	0.94 (0.51) (0.5-1.5)	2 (1.73) (0-3)	4 (2.65) (2-7)
Advanced (n=2)	26.5 (0.71) (26-27)	21 (0) (21-21)	2 (0) (2-2)	9 (4.24) (6-12)	3 (0) (3-3)

As seen, the subjects, whether English or French, ranged in age from 20 to 40 years old at the time of testing. All of them started learning Turkish after age 16, and most around age 20-30. Most of them, irrespective of their L1, had 1 to 2 years of formal instruction in Turkish, though there was one beginner, one low intermediate, and one advanced English-speaking learner with no formal instruction (aside from self-study). Except for 5 English- and 1 French-speaking subject, all had spent some time in Turkey. All of the subjects had some regular naturalistic input to Turkish. Most had Turkish partners, and some had Turkish roommates or friends with whom they communicated regularly in Turkish. None of the subjects was a heritage learner of Turkish.

5.3 Materials and stimuli

A semi-controlled production experiment was conducted in order to determine the prosodic representations that English- and French-speaking learners of Turkish employ in producing Turkish words. More specifically, the experiment was designed to identify whether or not, in their production of Turkish words, learners use foot structure, and if so, what kind of footing they use (e.g. trochaic or iambic, iterative or not, weight-sensitive or not, etc.). That is, the aim was to reveal all aspects of a learner's word-level prosody, including all the parameters given in (1) and (2) in Chapter 4.

To this aim, a set of stimuli, composed of 70 words (all nouns), of various lengths and syllable structure profiles, was generated. 20 of these were bisyllabic, and 40 trisyllabic. There were also 5 four-syllable and 5 five-syllable words which were later excluded from the analysis (see below). For all bisyllabic and trisyllabic words, weight profiles of each syllable were controlled, resulting in 4 bisyllabic and 8 trisyllabic conditions. These represented all possible Light (L) and Heavy (H) syllable combinations, i.e. LL, LH, HL, and HH for bisyllabic words, and LLL, LLH, LHL, LHH, HLL, HLH, HHL, and HHH for trisyllabic words. Within each condition, there were 5 words, resulting in the 20 bisyllabic and 40 trisyllabic stimuli. Table 5.3 shows examples of stimuli that fall under each condition. The full set of stimuli can be found in Appendix F.

Table 5.3: Example stimuli

Bisyllabic:			
LL	LH	HL	HH
kedi	çatal	elma	bardak
cat	fork	apple	glass/cup

Trisyllabic:							
LLL	LLH	LHL	LHH	HLL	HLH	HHL	HHH
araba	tebeşir	yumurta	örümcek	şemsiye	portakal	dondurma	defterler
car	chalk	egg	spider	umbrella	orange	ice-cream	notebooks

Light syllables had a simple nucleus, with or without an onset in word-initial position. Because onsets do not contribute weight to a syllable in the vast majority of languages, they are not relevant for the purpose of stress assignment, and their presence/absence was not controlled in these experiments, except that it was ensured that there were no vowels in hiatus. As for Heavy syllables, these had a simple nucleus plus a coda consonant. With the exception of two words, heavy syllables with complex nuclei (i.e. long vowels) were not included, because, as mentioned earlier, there are very few words in Turkish with complex nuclei, and all of these are borrowed from other languages. In addition, the fact that, in English (the only footed language examined in this thesis), both long vowels and codas are weight-sensitive makes it sufficient for the purposes of this thesis to only use syllables with codas as examples of heavy syllables.

Except for two words, all coda plus onset sequences in the stimuli were either sonorant + obstruent, sonorant + sonorant, or obstruent + obstruent sequences. Sonorants were limited to liquids and nasals; obstruents included stops, fricatives and affricates. Coda + onset sequences of the profile obstruent +

sonorant were avoided, for they would most likely be syllabified as complex onsets in English and French, even though they are licit coda + onset sequences in Turkish, since Turkish has no complex onsets. If a medial coda + onset sequence in a Turkish word like *kap.lan* “tiger” were analyzed as a complex onset by the English and French subjects, and were, thus, syllabified as *ka.plan*, the initial heavy syllable would become light, which could impact stress location.

Further, in generating the stimuli, special attention was paid to only include commonly used words so that they would be known even by the lowest-proficiency learners of Turkish. In addition, it was ensured that these were all concrete nouns that could be depicted via a picture and, based on the picture, presumably retrieved without much difficulty by the subjects. Finally, the only morphologically complex forms were a handful of plurals.

All 12 conditions presented in Table 5.3 serve to reveal important aspects of a learner’s prosodic grammar. In fact, it is impossible to have clear insight into a speaker’s prosodic grammar without looking at a variety of light and heavy syllable combinations. To see this, examine the two words in (1):

(1) a. kédi   b. pórtakal

If a speaker puts stress on the first syllable in (1a), that does not necessarily mean that the speaker has a trochaic grammar as in (2a); it could also be that it is iambic with Extrametricality set to *Yes*, as in (3a). In fact, even the presence of initial stress in (1b) is not evidence for the presence of a trochaic grammar, as in (2b); this could be an iambic grammar where the last syllable is extrametrical and codas are weight-sensitive, as in (3b).

(2) Trochaic: a. (kédi) b. (pórta)kal or (pór)takal

(3) Iambic: a. (ké)<di> b. (pór)ta<kal>

Only if outputs such as (4) are also observed in the same grammar can one make an argument for the trochaic status of this grammar:

(4) a. áraba b. tébeşir

These would, then, be represented as in (5) (see below on the alternatives for the final syllable):

(5) a. (ára)<ba> or (ára)ba

b. (tébe)<şir> or (tébe)şir

That is, looking only at forms like those in (1) is not enough to draw conclusions about the grammar of a learner, even if the issue to be probed is only about whether the grammar is trochaic or iambic. We need additional forms like (4) to arrive at such a conclusion. Notice, however, that, even with these additional forms, we cannot, yet, determine the correct setting of a parameter like Weight-Sensitivity. That the final syllables in (4) are unstressed could either be due to the footing being left-to-right and weight-insensitive (i.e. [(ára)ba], [(tébe)şir]), or because final syllables are extrametrical ([i.e. [(ára)<ba>], [(tébe)<şir>]), irrespective of the direction of footing. That is, even with 4 different word profiles, those in (1) and (4), many questions remain about the shape of the grammar. If we also found, in the same grammar, forms like (6), we would, then, know, additionally, that the system under focus is weight-insensitive (or at least that codas are not weight-sensitive),[3] for the H is not stressed, and heavy syllables do not, thus, have to be in the head position of a foot, as in (7):

(6) yúmurta

(7) (yúmur)ta or (yúmur)<ta>

We would still not know, as demonstrated in (7), why final syllables are unstressed. This could either be because final syllables are unfooted in words with odd-numbered syllables (e.g. because of Directionality being Left-to-Right and feet being Binary at the syllabic level), or because final syllables are extrametrical. That is, we would still not know the correct setting of a parameter like Extrametricality in the absence of longer words in weight-insensitive grammars. In sum, then, it is optimal to look at a variety of word profiles in order to be able to make sound conclusions about all aspects of a given learner's grammar. It is, therefore, critical that in the current research, all possible combinations of heavy and light syllables are employed. This, of course, comes with the disadvantage of making it difficult to generate stimuli, especially when all words used have to be concrete nouns that are frequent enough to be known by lower-proficiency learners.

---

[3] Strictly speaking, based only on the stress patterns of syllables with codas, one cannot necessarily conclude that when they are not stressed, it is because of weight-insensitivity, unless syllables with long vowels are also scrutinized, which has not been done since, as mentioned above, there are very few words with long vowels in Turkish, and all of these are borrowings from other languages.

In addition to the bisyllabic and trisyllabic stimuli that are exemplified in Table 5.3, there were also 5 four-syllable and 5 five-syllable stimuli. These were included in case some learners have Extrametricality set to *Yes*, in which case, the best way to have insight into the correct settings of certain parameters, such as Iterativity, would be through examining four- and five-syllable words. In fact, in an interlanguage grammar where Extrametricality is set to *Yes*, as in English, while Weight-sensitivity is set to *No*, unlike English, the only way to identify whether Iterativity is set to *Yes* would be through an examination of five-syllable words. For these reasons, words longer than three syllables were also included.[4]

Longer stimuli were not controlled in terms of their weight profiles, because it was difficult to find enough Turkish nouns of this type that would be known by lower proficiency learners, would be picturable, and would also be possible to control in terms of the weight of each syllable. In fact, finding four- and five-syllable words of any syllable weight profile that met these criteria proved to be a very difficult task. Though Turkish is an agglutinative language, and thus, it allows very long words, most nouns are short or, when long, they tend to be abstract. Although a handful of four- and five- syllable words were found, these turned out to be problematic in two respects: First, several of these were words borrowed from English or French; because of this, they posed problems as to increasing the possibility of transfer effects. Second, and more importantly, it was

---

[4] However, given the PAPH, Extrametricality should be quite easy to reset, in the presence of ample evidence that final syllables of Turkish words get word-level prominence. Second, an interlanguage grammar where a parameter that is easy to reset, such as Extrametricality, stays in its original setting while Weight-Sensitivity, which is predicted to be more difficult to reset, is reset is not predicted on the PAPH. Nevertheless, in order to control the effects of these hypothetical cases, longer words were also included in the experiment.

noticed during the transcription process, that most of these words were produced by the learners with an internal pause. Therefore, as with other forms that were occasionally produced with a pause, many of these words had to be excluded from the analysis (see Chapter 6 for more on such exclusions). In the end, because of the large number of such exclusions, these forms were removed altogether from the analysis. This decision was facilitated by the fact that, as expected, only two English subjects, those with the lowest level of proficiency, showed effects of Extrametricality, and they did not, as predicted, reset Weight-Sensitivity from *Yes* to *No* (more on this in the next chapter).

5.4 Procedure

The subjects were tested individually in a sound-attenuated booth at McGill University. Order of testing was as follows: the background questionnaire, production experiment, and two proficiency tests (the read-aloud task and the cloze test). For the French subjects, the English read-aloud task followed the Turkish read-aloud task.[5]

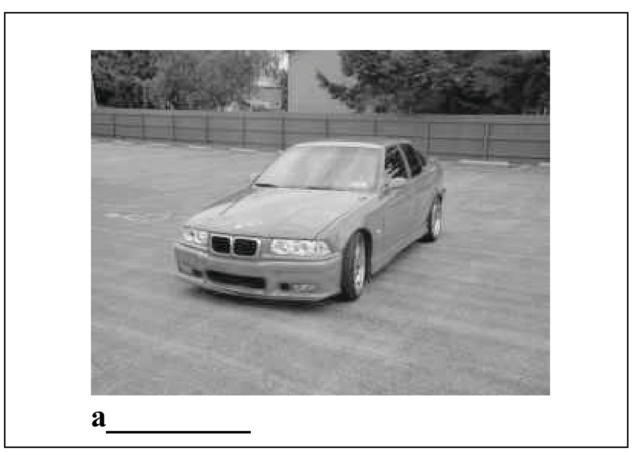
The background questionnaire and the cloze test were completed in a paper-and-pencil format. The production experiment and the read-aloud tasks were completed on computer. The subjects were audiorecorded using Audacity (http://audacity.sourceforge.net) onto a MacBook Pro laptop, with the help of an external Logitech microphone. The microphone was placed approximately 20 cm from the speaker's lips. The subjects were instructed to speak as naturally as

[5] For two of the French subjects, the English read-aloud task was administered later, in a second session, for this task was added after they had already completed the experiments and all other tasks.

possible. The audio files were saved in .wav format to prevent any potential loss of information caused by data compression that would result from using other formats.

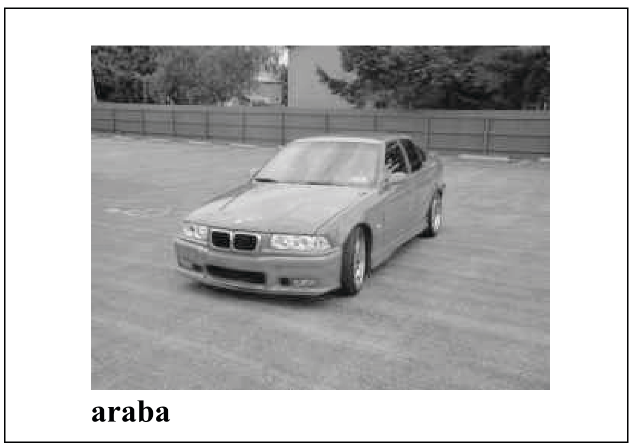
The experimental stimuli in the production experiment were pseudo-randomized. They were first uttered in isolation, and then in a carrier sentence, namely, *Bu resimde* __*X*__ *var*, "There is__*X*__in this picture." Only the words produced in the carrier sentence were later transcribed and analyzed (see below). Each stimulus was presented in three steps. First, a picture of the target word appeared as a Powerpoint slide on the computer screen, together with the first letter of the target word (see Figure 5.1). The subject's task at this stage was to provide the name for the item pictured. The first letter was provided to help them retrieve the word from memory, and trigger the correct form in cases where there are synonyms. In the example test item given below, the presence of the first letter helps a subject choose the correct word out of the two possible, *araba* "car" vs. *otomobil* "automobile."

Figure 5.1: Example test item: Step 1



In the event that they did not know the word or knew it but could not retrieve it from memory, they were asked to produce the first letter of the word before moving to the next step (Step 2) (by clicking on the slide), where the name of the object was given orthographically (see Figure 5.2), which was to be read aloud (whether or not they knew the word in Step 1). This procedure made it possible to know which words were not previously known by a given subject (those whose first letters only were produced in Step 1). In addition, reading aloud the word in Step 2 ensured that all target words were produced.

Figure 5.2: Example test item: Step 2



As well as ensuring that all words were produced, the presence of both Step 1 and Step 2 made it possible to check for any possible reading effects, or effects that were caused by not knowing a given word, since words that were known by learners could, then, be compared with those that were not known.

At Step 3, the picture was repeated once again, this time with the frame sentence (see Figure 5.3). Once the subjects uttered the target word with the sentence frame, they moved on to the next stimulus by clicking on the slide.

Figure 5.3: Example test item: Step 3

Bu resimde _______ var.

The reason for using a carrier sentence (Step 3) and limiting the analysis to the words uttered in this sentence was to avoid any confounding variables such as utterance-final lengthening or pitch fall that could potentially be caused if a word was said only in isolation, producing a list effect, thereby potentially suggesting more final stress than the subject might normally produce. In addition, the fact that words were first presented and produced in isolation (Steps 1 & 2) helped remove any effects of guessing from Step 3. Words that are guessed are often pronounced with a "question intonation," and are, thus, potentially lengthened and uttered with a rising pitch.

The reasons for using this particular carrier sentence are twofold: First, the target word in this sentence is in the prosodically strongest position of the sentence, the position that heads both the PPh, i.e. [**X** var]$_{PPh}$, and the I-Phrase, i.e. [[Bu resimde]$_{PPh}$ [**X** var]$_{PPh}$]$_{I}$, that is, the leftmost PWd within the rightmost PPh in the I-Phrase (Özçelik & Nagai 2011). In other words, no stress reduction is observed. Further, the sentence is rather short, decreasing the processing load, thereby reducing the effects of yet another variable that could potentially influence the results by leading to word- or sentence-internal pauses.

Finally, it should be noted that before the subjects started the test, in order to ensure that they fully understood the task, there was a practice session of two words. At this step, the experimenter made sure not to utter the words in an effort to avoid influencing the subjects' pronunciation. After the practice session, the experiment started with two words which were not transcribed or analyzed, to avoid potentially negative effects of just starting the test.

In sum, this chapter has outlined the experiment, as well as providing information on the subjects, materials and stimuli, and procedures employed in conducting this experiment. The results of the experiment are reported in Chapter 6, together with a discussion. Both group and individual results are discussed.

Chapter 6: Results & discussion

The results of the experiments largely confirm our hypotheses. As was predicted, it was found that while French-speaking learners had no significant difficulties with word-level prominence in Turkish, and consistently produced the experimental words with final prominence, English-speaking learners had a variety of difficulties, which resulted in a stage-like behavior across learners consistent with the stages proposed in Chapter 4.

Further, even when English-speaking subjects produced words with final prominence, they did this by means of aligning the head of a foot with the right edge of an experimental word, i.e. with foot structure, as was evident from the fact that they produced these words with either significantly higher intensity or, more commonly, with longer duration on the stressed syllable. This wasn't the case with most of the productions of French subjects, however, despite French being a language that uses duration, too (see Chapter 3), and arguably to a greater extent (i.e. more consistently) than English. This suggests that differences in the behavior of the two groups of subjects are attributable directly to the structural differences underlying their L1s - that is, whether the L1 has foot structure or not - and *not* to the differences observed on the surface, such as whether duration is a cue that is commonly used in the L1 or not, thereby lending further evidence to the theoretical assumptions made in this thesis.

In what follows, first, detailed information is given, in Section 6.1, about the data analysis process, followed by a discussion of general results in Section 6.2, where the results are presented in terms of (i) primary stress/prominence (irrespective of whether it involves foot structure or not), and (ii) iterativity, the two *surface* correlates of (non)-native-like prosody. This section is followed by a discussion of individual grammars by making reference to the stage-like behavior that is predicted by the PAPH to occur for English-speaking learners (Section 6.3). In fact, it is only through a detailed analysis of individual results, under all conditions (such as LL, LH, LLL, LHH, etc.), that the stage-like behavior proposed in the previous chapter becomes apparent, for the same surface outputs (such as final stress) can be achieved through a number of different mechanisms at the structural level (such as weight-sensitive iambs and weight-sensitive trochees both resulting in final stress in LH words, and initial stress in HL words). Section 6.4, then, focuses on a subset of the data, the LL condition, and compares the acoustic cues used by the English- and French-speaking subjects to mark prominence. Particularly informative here is a comparison of the English-speaking subjects who have an iambic grammar and French-speaking subjects; it is argued here that the two groups of subjects achieve final prominence through different means, through iambs in the case of English speakers (as was predicted in Chapter 4), and through a separate mechanism of footless intonational prominence by French speakers. Finally, Section 6.5 summarizes the findings, and concludes the chapter.

6.1 Data Analysis

The words produced by the subjects were transcribed and annotated for stress placement using Praat acoustic analysis software (Boersma & Weenink 2011). The following acoustic parameters were measured for each experimental word in determining the presence/absence and location of each stressed syllable, as well as syllable weight: vowel and syllable duration (in ms), average and peak intensity (in dB), average fundamental frequency (F0, in Hz), and time of F0 peak. In addition, the first and second formant frequencies (F1 and F2, in Hz) were noted in order to map the subjects' vowel space, since the duration values of certain vowels (e.g. high vowels) are inherently lower than others (e.g. low vowels) (Fonagy 1966, Beckman 1988).

Sentences in which there was a pause between the syllables of the experimental word were excluded from the analysis. Since four- and five-syllable words involved an especially high number of pauses, particularly for certain low-proficiency learners, these were completely excluded. In addition, one trisyllabic stimulus was excluded from analysis for all learners, since this was treated as bisyllabic by the majority of the subjects, resulting in 20 bisyllabic and 39 trisyllabic stimuli. For the remaining bisyllabic and trisyllabic stimuli, exclusions for reasons of pause or other reasons did not exceed 3% (see note 2).

The experimental words in the sentences in the LL condition were further analyzed for intensity, pitch, and duration through the use of TextGrids in Praat (Boersma & Weenink 2011), which allow both points and intervals of spectrograms and waveforms to be annotated. The textgrids were created through the use of a script[1] that automatically opened each audio file to be annotated in Praat and created textgrids with tiers for words, syllables and vowels to be hand-labeled. Duration, intensity and pitch measurements of the labeled intervals were, then, extracted using another script, which transferred all acoustic measures (intensity, pitch, duration) to a spreadsheet, on which statistical analyses were

---

[1] Many thanks to Michael Wagner for providing the scripts and assistance in running them.

conducted.

There were several reasons for focusing on the LL condition in the textgrid analysis: Fist, acoustic cues in longer words tend to be affected more easily by extralinguistic factors such as word-internal pauses which are commonly observed in L2 speech; such effects are best controlled in bisyllabic words. Second, since LL words do not involve any syllables with codas, vowel duration alone is a good predictor of syllable length. In conditions that have syllables with codas, vowel shortening before codas, a phenomenon observed in many natural languages, might, otherwise, influence duration measurements since vowels in open syllables are normally longer than those in closed syllables. At the same time, closed syllables contribute to syllable length by virtue of the presence of the additional segment in the coda position, and some consonants, like continuants, can sometimes arbitrarily be produced longer. Words composed only of open syllables are, therefore, ideal to keep the effects of context on vowel/syllable length under control. Third, since both syllables in the LL condition are underlyingly short, this condition allows us to best distinguish between a trochee and an iamb, and, crucially, permits us to spot cases where syllable weight is derived; certain syllables (such as final syllables) will, after all, be lengthened for reasons of e.g. iambic lengthening, which may not as readily be observed if those syllables already bear weight by means of having a coda. Finally, this is the only condition where stress is expected to fall consistently on the final syllable for learners with iambic grammars and on the initial syllable for learners with trochaic grammars (assuming no extrametricality with iambs), permitting better comparisons across trochaic and iambic grammars. In sum, words under this condition will best serve to distinguish the acoustic cues of trochaic, iambic, and footless grammars. In iambic grammars, for example, heads of feet (the final syllables of LL forms) are typically longer than non-heads (see e.g. Hayes 1995), whereas no such effect is expected in grammars that are footless. Similarly, in trochaic grammars, heads (initial syllables in LL forms) are expected to bear higher intensity than non-heads, which, again, is not expected in footless or iambic systems.

Segmentation criteria were based on both spectrogram and waveform cues, as suggested by Peterson & Lehiste (1960). In particular, the following criteria were used in determining syllable and vowel boundaries: (i) The first upward-going zero crossing at the beginning of the waveform was used to isolate the onset of the first syllable; (ii) for the offset of the first and the onset of the second syllable, in words without a stop consonant as the onset of the second syllable (e.g. *gemi "ship"*, *para "money"*), the boundary between the offset of the first and the onset of the second syllable was determined as the transition between the spectrographic pattern of the last segment of the first syllable and the first segment of the second; (iii) in words with a stop consonant as the onset of the second syllable (e.g. *kedi*), this boundary was defined as the starting point of the silence of stop closure; (iv) second syllable/word offset was determined as the end point of the waveform at the final downward-going zero crossing. These criteria were used, in making decisions on vowel/syllable length, in both the initial transcriptions and textgrid annotations, though syllable and vowel boundaries were marked only in textgrids, for statistical purposes.

6.2 General results

6.2.1 Final prominence

Table 6.1 below presents general data on which syllable, for both bisyllabic and trisyllabic words, bore primary stress/prominence in the utterances of both English- and French-speaking subjects, irrespective of whether this prominence was a result of foot structure or not (this issue is considered later in 6.4). In each cell, percentages are given first, followed by standard deviations in parentheses. Recall, from Chapter 5, that there were three groups of English- and French-speaking subjects, beginners, low intermediates, and advanced learners, as determined by the overall results of two proficiency tests (cloze test and the read-aloud task).

Table 6.1 Location of the syllable bearing primary stress/prominence (whether footed or not) (in percentage, %)[2]

	Bisyllabic		Trisyllabic		
L1 Eng. (n=13)	**Penult**	**Final**	**Antepenult**	**Penult**	**Final**
Beginner (n=2)	90.00 (0.00)	10.00 (0.00)	49.70 (39.70)	36.64 (36.10)	13.66 (3.61)
Low Inter. (n=8)	44.11 (38.94)	55.89 (38.94)	34.45 (35.94)	16.93 (13.75)	48.63 (36.48)
Advanced (n=3)	35.00 (43.59)	65.00 (43.59)	32.22 (37.23)	15.96 (4.71)	51.82 (38.68)
L1 Fr. (n=6)	**Penult**	**Final**	**Antepenult**	**Penult**	**Final**
Beginner (n=1)	15.00 (-)	85.00 (-)	11.43 (-)	5.71 (-)	82.86 (-)
Low Inter. (n=3)	11.67 (5.77)	88.33 (5.77)	13.37 (5.62)	7.21 (10.23)	79.41 (12.40)
Advanced (n=2)	7.50 (10.60)	92.50 (10.60)	6.66 (5.88)	7.71 (3.25)	85.64 (2.63)

As expected, percentage of words with final prominence is very high for the French-speaking subjects, irrespective of level of proficiency. In fact, they produced Turkish words with final prominence from the beginning of the language acquisition process. For both bisyllabic and trisyllabic words, beginner, intermediate and advanced learners performed very similarly (around 85-90% correct). The results of a one-way ANOVA confirm that the difference between the three groups is not statistically significant, neither for bisyllabic ($F = (2, 3) = 0.3488$, $p = 0.7308$, i.e. $p>0.05$) nor trisyllabic words ($F = (2, 3) = 0.2255$, $p = 0.8105$, i.e. $p>0.05$). As predicted, then, level of proficiency did not play an

[2] 0 bisyllabic and 5 trisyllabic stimuli in total were excluded for English beginners; 2 bisyllabic and 14 trisyllabic stimuli in total for English low intermediates, and 0 bisyllabic and 3 trisyllabic for the English advanced. For the French subjects, no stimuli were excluded, for any of the groups, from the bisyllabic words. From the trisyllabic stimuli, 4 in total were excluded from the beginner learner, 8 from the intermediates, and 4 from the advanced. Overall, 0.77% of bisyllabic and 4.14% of trisyllabic stimuli were excluded for English learners, and 0% bisyllabic and 6.83% trisyllabic words for French learners.

important role for French-speaking learners' performance on Turkish final prominence.

What might look surprising are the results of the English-speaking learners, whose performance (on stressing the word-final syllable) did not improve much depending on proficiency level, unlike what was predicted in Chapter 4. Whereas beginners stressed the final syllable of words only 10% and 13.66% of the time for bisyllabic and trisyllabic words respectively, and these figures rose to 65% and 51.82% for advanced learners, there was not much difference between the advanced learners and low intermediates, who had final stress 55.89% of the time for bisyllabic words and 48.63% of the time for trisyllabic words. In addition, there was a great deal of individual variation among all the subjects, even for those within the same proficiency group, except for the beginners, as indicated by the high standard deviations, which was not the case for the French-speaking learners. The results of a one-way ANOVA also confirm this variation; the differences between the three proficiency groups were not statistically significant, for bisyllabic ($F = (2, 10) = 0.3488$, $p = 0.7308$) or trisyllabic words ($F = (2, 10) = 1.4365$, $p = 0.2829$). Further, the results of a Tukey HSD test show that there was no significant difference between any of the pairs ($p > 0.5$ for each pair). Even for the Advanced/Low beginner pair, which had the greatest difference, the p-value was 0.2952 for bisyllabic, and 0.4845 for trisyllabic outputs.

The substantial amount of individual variation is due to a number of different factors, and is not completely unexpected. First, many of these grammars will not yield final stress all the time. Some grammars will result in final stress under certain conditions but not under others. Word-final stress can, after all, be achieved through a number of different interlanguage (IL) grammars, which are predicted to arise, roughly, at different proficiency levels, such as Strategy 2 of Chapter 4 (trochaic grammar with final lengthening), which could be employed by lower proficiency learners, versus Strategy 3 (iambic), which is expected to arise at later stages, since it involves more changes in the grammar, with respect to prosody; that is, it is possible to see a lower-level learner using one mechanism and producing more words with final stress than a higher-level learner who uses another mechanism and produces fewer outputs of this type. Second, the variation among the advanced subjects is largely due to the presence of an outlier, namely one of the advanced subjects who still had a trochaic grammar. When this learner is excluded from the analysis, advanced English-speaking learners' performance seems better, at 90% for bisyllabic (SD: 7.07) and 73.69% (SD: 11.17) for trisyllabic words. This leads to a more systematic increase, based on proficiency level, in words produced with final stress, with beginners achieving final stress 10% of the time, intermediates 55.89% of the time and the (new) advanced 90% of the time for bisyllabic words; and 13.66%, 48.63%, and 73.69% of the time respectively for trisyllabic words. The resulting variation is illustrated with the box plots in Figures 6.1 and 6.2 below, for bisyllabic and trisyllabic words respectively. The differences between each group of learners are still not statistically significant, though they approach significance for bisyllabic words as the results of a one-way ANOVA indicate, $F = (2, 9) = 2.7396$, $p = 0.1177$ for bisyllabic; $F = (2, 9) = 1.7466$, $p = 0.2286$ for trisyllabic words. Lack of clear effects was partially due to the lower number of subjects in the advanced and beginner groups.

Figure 6.1: English subjects: bisyllabic words with final stress/prominence (in %)

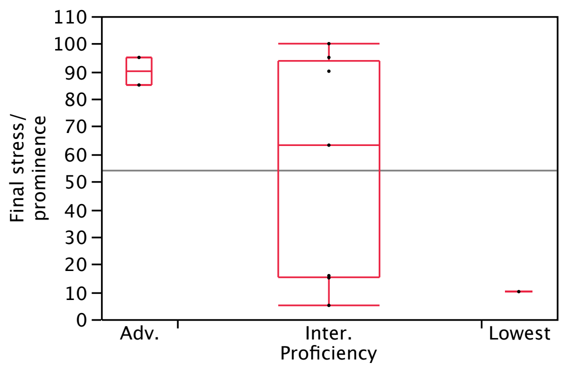
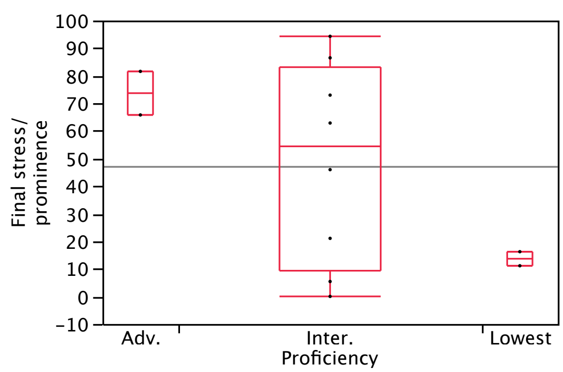


Figure 6.2: English subjects: trisyllabic words with final stress/prominence (in %)



Even after the exclusion of the advanced outlier, no firm conclusions can be made from the general results, for there is still a great deal of individual variation, especially among intermediate subjects, with some of them seemingly doing, with respect to final prominence, better than advanced learners, and some doing worse than beginner learners. More importantly, collapsing learners' outputs under final stress/prominence is not informative with regard to the actual parameter settings each subject makes in achieving these results. It is, therefore, a must to examine individual results in studies like this, which will be the main focus of this chapter (see Section 6.3).

All in all, the general results are informative only to the extent that they reveal the significant differences that exist between the English and French groups in general, as confirmed by the results of a one-way ANOVA, $F = (1, 17) = 5.4338$, $p = 0.0323$ for bisyllabic; $F = (1, 17) = 6.8018$, $p = 0.0184$ for trisyllabic words. They are also informative in revealing a substantial amount of individual variation in the English group, especially the intermediates who seem to be trying a variety of options, as opposed to the uniform behavior of the subjects in the French group.

6.2.2 Iterativity

Before considering what underlies the extreme variation among the English speakers, general results on Iterativity are examined here. Iterativity, the presence or absence of secondary stress, is a property of words with foot structure. In fact, stress is iterative in a language precisely because words in the language can accommodate more than one foot. Intonational prominence, such as the final prominence in Turkish, is never iterative, and is only attracted to the edges of prosodic constituents. At the same time, it has been shown, as mentioned in Chapter 3, that some languages, like French, have secondary-level prominence that is not iterative (see e.g. Jun & Fougeron). This, as explained in the same chapter, is optional, and is attracted to the left edge of a PPh, and does not, for these reasons, seem to involve foot structure. Given these facts, it is evident that the presence of secondary-level prominence in L2 Turkish cannot, by itself, be attributed to the presence of foot structure, but absence of it will serve to make learners sound more native-like with respect to Turkish word-level prominence, since Turkish has no secondary stress or prominence. With these in mind, the current section presents results on words that had secondary level stress/prominence, for both English and French learners, whether this was due to foot structure or not.

As was discussed in Chapters 2 and 3, stress languages can set Iterativity to *Yes* or *No*; that is, even if the language sets Footedness to *Yes*, it can set Iterativity to *No*. Generally though, even if a grammar has the *Yes* setting of Iterativity, the evidence for it may often be disguised. That is, there need to be enough syllables or moras in a word to accommodate more than one foot, for feet are usually binary either at the moraic or syllabic level. In languages like English, where feet are bimoraic (binary at the moraic level), this is satisfied by having at least four moras in a word (such that two binary feet can be created). In short, not all words will have iterative feet even in L1 English; despite the *Yes* setting of Iterativity, many words will satisfy it vacuously.

Given also that final syllables are extrametrical in English (see Chapter 3), if the Turkish experimental words used in this thesis were to be uttered by the English-speaking learners with English prosody, only in one condition, out of 12 (5 out of 59 test items), would iterative footing be observed, that is only in the HHH condition, leading to about 8.47% secondary stress, when all experimental words are factored in. The experimental words with all other weight profiles can only accommodate one bimoraic foot in such a system. If Extrametricality is reset to *No*, on the other hand, as was done by the majority of the English-speaking subjects, the words in the HH, LLH, HLL, HHL, LHH, HLH, and HHH conditions will all bear secondary stress, as long as Iterativity stays set to *Yes*. That is 7 conditions, out of 12, (34 out of 59 test items) will be informative as to Iterativity. Learners having such a grammar will still not create iterative feet in the following conditions: LL, HL, LH, LLL, LHL. In other words, iterative feet, in such a grammar, are expected to arise around 57.63% of the time.

The situation gets more complicated, however, when other factors are taken into account, such as the presence/absence of degenerate feet, Foot-Shape, and augmentation of light syllables. If the same learner (i.e. one with the English settings of all parameters except for Extrametricality) also allows degenerate feet, for example, as one intermediate English-speaking learner consistently did, iterative feet will, additionally, appear in the LH, LLL and LHL conditions, leading to even higher percentages of secondary stress (about 81.67% of the time, i.e. in 49 out of 59 words when all words are factored in). Similarly, if the learner uses strategies such as word-final vowel lengthening (see Strategy 4 in Chapter 4), this percentage would, of course, rise even more, for, in such a system, all experimental words, except for those in the LL condition (unless degenerate feet are additionally allowed), would bear secondary stress, since word-final lengthening contributes an extra mora, leading to secondary stress in 55 out of 59 experimental words, i.e. about 93.22% of the time). Several other patterns are possible, depending in addition on foot headedness and whether binarity is satisfied at the moraic or syllabic level, etc.; it is not the purpose of this section to cover all hypothetical combinations. The point here is that iterative footing will never be observed 100% of the time in a language (L1 or L2), even when Iterativity is firmly set to *Yes*. At the same time, there is no single best way of choosing words that would be long enough to accommodate iterative stress, and basing calculations only on those words (to determine if iterativity arises in all cases where it is possible), since this will all depend on the settings of other parameters in the grammar, as mentioned above. The results on Iterativity presented in this section are, therefore, based on *all* words, not just those that are long enough to accommodate iterative feet.

With these considerations in mind, before we present the results, recall from Chapter 4 the predictions of the PAPH with respect to Iterativity. Iterativity is a parameter that has several embeddings underneath it in the parameter tree (see (2) in Chapter 4), and thus, it should be very difficult to reset it from *Yes* to *No*. And since, in English, as opposed to French, it is set to *Yes*, it should be additionally difficult to reset it to *No* for Turkish, since going from *Yes* to *No* was hypothesized to be harder. The results of the experiments confirm this hypothesis; English-speaking learners had substantial difficulties with Iterativity, and therefore, produced words with secondary stress whenever the word was long enough to accommodate more than one binary foot. French-speaking learners, on the other hand, did not have any difficulties with this parameter, which was expected, since French does not have foot structure, nor does the L2 Turkish of French learners. The results are summarized in Table 6.2 below.

Table 6.2: Iterativity

	Percentage (and SD) of words with iterative stress
L1 English (n=13)	
Beginner (n=2)	46.43% (17.68)
Low Intermediate (n=8)	74.34% (11.32)
Advanced (n=3)	41.75% (22.19)
L1 French (n=6)	
Beginner (n=1)	5.46% (-)
Intermediate (n=3)	5.82% (1.05)
Advanced (n=2)	4.37% (1.39)

The results of a one-way ANOVA confirm that the difference between English- and French-speaking learners is highly significant, $F = (1, 17) = 44.5851$; $p < 0.0001$. Further, for the English-speaking subjects, there is a significant group effect ($F = (2, 10) = 6.6755$; $p = 0.0144$), with advanced and beginner subjects having significantly fewer words with iterativity than intermediate subjects ($p = 0.0217$ for Advanced/Intermediate, $p = 0.0893$ for Beginner/Intermediate, according to the results of a Tukey-Kramer HSD pair test. There was no significant effect for the Advanced/Beginner pair, $p = 0.9366$). On the other hand, no significant group effect was observed among the French-speaking subjects ($F = (2, 3) = 0.9270$; $p = 0.4859$), who do not seem to be having any problems with Iterativity, regardless of level of proficiency. The few words that French subjects produced with secondary stress could be attributed to the (optional) accentual arc in French (see Chapter 3) or performance effects, or both.

Note, again, that the reason why no English subject had 100% iterativity, despite Iterativity being set to *Yes*, is because all words were factored in for the reasons mentioned above, and not all conditions have words that are long enough, for any particular learner, to allow for the creation of a second foot. Given this, the figures in Table 6.3 suggest that Iterativity is strongly present in the interlanguage grammars of the English-speaking subjects, as will also be seen more clearly later in Section 6.3, when we analyze individual results.

What might look unexpected in Table 6.2 are the figures for the advanced and beginner English-speaking subjects. On closer look, though, these are not unexpected. The low percentages of Iterativity for the advanced learners is because one of them, Subject M.F., had started to reset this parameter from *Yes* to *No*, and thus had significantly fewer syllables with secondary stress than the other English-speaking subjects (at 20.69%). Though the PAPH predicts Iterativity to be extremely difficult to reset, it does not predict it to be impossible, unlike what is predicted for Footedness. At least some learners, at very advanced levels, should, then, be able to reset it. It is quite telling, in this regard, that only the most advanced subject in the experiment could do this.

As for the beginners, since they are still in transition from the *Yes* setting of the Extrametricality parameter to the *No* setting, the number of words that permit more than a single foot was limited, as the final syllable did not factor into the calculation. This was, in particular, true for one subject, P.G. (see below), who not only had a trochaic grammar, but also did not stress the final syllables of words even when they were closed (heavy), for he treated those syllables as extrametrical. This, in practice, resulted in forms such as LLH and HLH, etc. being represented as [(LL)<H>] and [(H)L<H>] respectively, meaning that a single foot could be created, instead of two.

6.3 The Path

As the above discussion illustrates, general results are only partially informative, for there is a lot of individual variation among the subjects, and subjects at the same proficiency level can reset different parameters, which can, then, result in different behaviour or success rates on the surface. Conversely, similar behaviour or success rates, with respect to, e.g., final prominence might be caused by different parameter settings for different learners. Collapsing all similar behaviour under such labels as final prominence or iterativity, as was done above, will fail to inform us of the exact nature of the grammars of these subjects, and will not reveal a path in development.

In this section, individual learner grammars are examined, and in doing so, the subjects are grouped based on their behaviour, that is, in terms of where they are located in the path that is predicted by the PAPH, instead of their proficiency level. Nevertheless, as will be seen, the order that is to be presented in this section corresponds *roughly* to proficiency level, as did the general results presented above.

This, of course, is true only for English speakers, as they are the ones whose L1 differs maximally from the L2 in terms of the parameters that are involved. For the French subjects, no such path is expected, nor is one found, as is also clear from the general results (see Table 6.1), since, for these learners, the L1 grammar is essentially the same as the L2 grammar with respect to the properties that are examined in this thesis (though domain of prominence is different in French, as mentioned in Chapter 3). We start, therefore, with the English subjects.

The English-speaking subjects' grammars corresponded to the stages predicted in Chapter 4, with the exception of Strategy 4, weight-insensitive iambs (i.e. the strategy by which learners were supposed to reset Head from *Left* to *Right*, and Weight-Sensitivity and Extrametricality from *Yes* to *No*), but with the addition, instead, of weight-sensitive iambs with iambic lengthening, a pattern that will be linked to a universal later in the chapter. There were six groups of learners in the end, illustrating six different patterns, which are covered, one by one, below: (i) two learners who used L1 settings of all parameters (i.e. those who had binary bounded iterative trochees with End-Rule set to *Right*, and Weight Sensitivity and Extrametricality set to *Yes*, as in English); (ii) five learners who only reset Extrametricality from *Yes* to *No*; (iii) one learner who did (ii) above in addition to lengthening word-final vowels, i.e. being unfaithful to the underlying vowel length, but having more syllables with final stress by doing so; (iv) one learner who did (ii) above in addition to resetting Head from *Left* (Trochaic) to *Right* (Iambic); (v) three learners who did (iv) above in addition to lengthening word-final vowels and (sometimes) all heads of feet (i.e. iambic lengthening); and (vi) one learner who did (v) above in addition to resetting Iterativity from *Yes* to *No*. These patterns are covered individually below, focusing on the grammar of one representative learner for each pattern.

6.3.1 English-speaking learners: illustrating the path

6.3.1.1 Stage 0: Full Transfer

There were two subjects who roughly belonged to this stage, the initial state of language acquisition, that is, the stage at which L1 settings of all parameters are used. As expected, the two subjects who belonged to this stage were those with the lowest level of proficiency, subjects P.G. and M.W., who, together, comprised the group of beginner learners, presented in Section 6.2 above. Both subjects had binary, bounded, iterative trochees, with Extrametricality and Weight Sensitivity set to *Yes*, and End-Rule to *Right*:

(1) Stage 0:

Parameter	L1 (English)	P.G. (Beg.)	M.W. (Beg.)
Foot shape	Trochaic	Trochaic	Trochaic
Extrametricality	Yes	Yes	Variable
Weight-sensitivity	Yes	Yes	Yes
Boundedness	Yes	Yes	Yes
Binarity	Yes	Yes	Yes
Iterativity	Yes	Yes	Yes
Direction	Right-to-left	Right-to-left	Right-to-left
End Rule	Right	Right	Variable

That is, they were speaking Turkish with English prosody. Some of M.W.'s outputs did not have Extrametricality; so he was starting to move to the next stage, where Extrametricality is reset to *No*. Almost all of P.G.'s utterances had an extrametrical final syllable, with a handful of exceptions. Since P.G. belongs to this stage more clearly than M.W. does (with fewer exceptions to Extrametricality), I will use P.G.'s data to exemplify this stage. Examine Table (2), which illustrates P.G.'s grammar at this stage. We will use similar tables in illustrating every stage, so a few words follow first as to how these tables should be interpreted.

(2) P.G.'s grammar

Condi-tion	L1 (English)	Interlanguage	Percentage		Exception	Explanation
Bisyllabic words:						
a. LL	[(ké)<di>]	[(ké)<di>]	100%	5/5	-	
b. LH	[(çá)<tal>]	[(çá)<təl>]	100%	5/5	-	
c. HL	[(él)<ma>]	[(él)<ma>]	100%	5/5	-	
d. HH	[(bár)<dak>]	[(bár)<dak>]	60%	3/5	pèynír	Extrametr.: No
Trisyllabic words:						
e. LLL	[(ára)<ba>]	[(ára)<ba>]	100%	3/3	-	
f. LLH	[(tébe)<şir>]	[(tébe)<şər>]	50%	2/4	dìnozó:r	Extrametr.: No
g. LHL	[yu(múr)<ta>]	[yu(múr)<ta>]	100%	7/7	-	
h. LHH	[ka(lém)<ler>]	[ka(lém)<ler>]	100%	4/4	-	
i. HLL	[(şém)si<ye>]	[(şém)si<ye>]	33%	1/3	hèmşíre	Extrametr.: No
j. HLH	[(pór)ta<kal>]	[(pór)ta<kal>]	50%	1/2	pàntalón	Extrametr.: No
k. HHL	[(dòn)(dúr)<ma>]	[(dòn)(dúr)<ma>	100%	4/4	-	
l. HHH	[ö̀ğrét<men>]	[ö̀ğrét<men>]	89%	8/9	şèmpànzí:	Extrametr.: No

Each row in this table represents a separate condition (e.g. LH, LLL, etc.). An actual example (from the subject's utterances) is provided per condition, with its weight profile in the first column, L1 English prosodification in the second column, and Interlanguage representation in the third column, followed by a percentage and proportion in the fourth and fifth columns showing how often the subject's outputs complied with the Interlanguage template given in the previous column.[3] The last two columns list all the exceptions to this pattern, together with an explanation as to the nature of these exceptions. If all exceptions are of the same nature, as is the case with all utterances of P.G., only one example is given, together with an explanation. In (2d), for example, there are two exceptions (given

[3] The word 'template' is used for convenience here; the templates arise from a set of parameter settings.

that the template is satisfied in 3 out of 5 cases), but both are related to Extrametricality, so only one of these two is exemplified.

One might wonder why the number of words uttered by P.G. under each condition does not match the number of words presented in the experiments for that condition (5 words per condition, whether bisyllabic or trisyllabic, with the exception of HLH, where there were 4 words). This was first because some forms were excluded, 3 trisyllabic forms in total, for P.G., for reasons such as the presence of a word-internal pause. Second, the weight profiles of some of the words were changed by P.G., by means of vowel lengthening. For example, two of the HLH forms were produced as HHH, by way of significantly lengthening the second syllable, which increased the number of HHH forms, while decreasing that of HLH. The resulting forms are still consistent with the grammar proposed here, and do not involve exceptions: *èldí:vən* and *mèrdí:ven* (instead of the target *eldiven* and *merdiven*).

Given only P.G.'s bisyllabic outputs, one cannot conclude that his final syllables are extrametrical; that these are always stressed on the first syllable could alternatively be because he is constructing syllabic, rather than moraic, trochees (i.e. Weight-Sensitivity could be set to *No*, or codas might not be weight-sensitive, etc.). Alternatively, his grammar could also be analyzed as iambic with an extrametrical final syllable.

The latter possibility is ruled out by an examination of his LLL forms (see (2e)); these cannot involve iambs, with or without extrametricality, for these, too, are stressed on their first syllable, as with bisyllabic forms. They would, if they were iambs, surface as stressed on their second or third syllable, second syllable if final syllables are extrametrical (i.e. [(ará)<ba>]) or if parsing is left-to-right (i.e. [(ará)ba]), third if Extrametricality is set to *No*, and if parsing is right-to-left (i.e. [a(rabá)]), but not on the first syllable. LLL forms do not, however, rule out, by themselves, the possibility of Extrametricality playing no role, for these could also be analyzed as trochees with left-to-right parsing and no Extrametricality (i.e. [(ára)ba]).[4] A comparison of P.G's LH and LHH forms is informative in this regard; that the first H is stressed in LHH (see (2h)), as opposed to the L in LH (see (2b)), is evidence that P.G.'s last syllables must be extrametrical, and that his trochees are weight-sensitive.[5] Further, that the second H bears primary stress in forms like HHL and HHH is evidence that End-Rule is set to *Right*.

All the exceptions to P.G.'s grammar, which are listed in the last column of (2), are Extrametricality-related; that is, they involve Extrametricality being *No*, and are all, otherwise, consistent with the grammar proposed here: they are, in other words, in line with a grammar that is trochaic, iterative, weight-sensitive,

---

[4] In fact, the data are insufficient to determine the correct setting of Directionality, because LLL forms, which would normally be the only helpful condition in determining this (given Weight-Sensitivity) prove unhelpful, since final syllables are extrametrical. Let us assume though that it is Right-to-Left, as in the L1, since there seems to be no reason to reset it to Left-to-Right based on input from Turkish.

[5] The first L being stressed in bisyllabic forms starting with an L (i.e. LH and LL) is the result of an inviolable requirement that every PWd must have at least one stressed syllable, or that every content word must have foot structure, i.e. [(Ĺ)<H>], [(Ĺ)<L>]. Thinking along the lines of a constraint-based framework might be helpful here: Assume that the grammar has a constraint that says every content word must have at least one syllable that bears stress (which is, in fact, a universal, at least for footed languages). Thus, assume also that this constraint is undominated; that is, it ranks above Ft-Bin. Given this, and given Extrametricality, the only syllable that is not extraprosodic in bisyllabic forms starting with an L is the first L, and that L will be footed, resulting in the parses in (2a) and (2b). Of course, this analysis assumes that Extrametricality ranks above Ft-Bin; alternative analyses exist: One such analysis would be for Ft-Bin to rank above both Extrametricality and Weight-Sensitivity - again with the undominated status of the requirement that every word must have one stressed syllable - resulting in parses like [(kédi)] and [(çátal)], as well as [yu(múr)<ta>]. For purposes of simplicity, I will assume that Extrametricality is the constraint that is respected here, across the board, thereby leading to a violation of Ft-Bin in the LL and LH conditions.

and has End-Rule set to *Right*, with the exception that these forms do not involve an extrametrical final syllable. The fact that P.G. did not have extrametrical final syllables 100% of the time could be either because, as with M.W., P.G. has started to switch Extrametricality from *Yes* to *No*, or because words are marked, in English, as to what type of constituent is extrametrical, and that there is not, thus, a single type of Extrametricality, whereby every word-final syllable is extrametrical. The latter is a possibility given that English itself does not respect Extrametricality in every noun (e.g. [(pàno)(ráma)], [(Mìssi)(ssíppi)]), which led researchers to propose different versions of Extrametricality. While Hayes (1981, 1982) proposed the most widely-accepted account of Extrametricality for English, namely, that the last syllable of English nouns is extrametrical, Kager (1989), for example, argued that English words are divided into at least three sets with respect to Extrametricality, those that involve syllable Extrametricality, those that involve consonant Extrametricality, and those that involve no Extrametricality. That is, even with some Turkish outputs that are not extrametrical, P.G. might be transferring the L1 grammar as a whole, and is, therefore, at the initial state, where one uses the L1 settings of *all* parameters.

6.3.1.2 Stage 1: Reset Extrametricality from *Yes* to *No*

Five of the English-speaking learners tested belonged to this stage, 4 intermediate (A.K., A.M., J.T. and S.T), and, oddly enough, one advanced learner (J.N.), who, somehow, did not go beyond the trochaic-without-Extrametricality stage.

As was predicted in Chapter 4, these learners had more words with final stress than those at Stage 0, for, unlike L1 English (or Stage 0 learners), final syllables are no longer extrametrical for learners at this stage, but, as with English, codas are still weight-sensitive, meaning that all word-final Hs will be stressed, despite foot shape still being trochaic. That is, words in 6 out of 12 conditions will be stressed on their final syllable, leading to around 50% final stress, given that 50% of the experimental words used in the current study ended in an H. Not all of these bore primary stress, however, since these learners' End-Rule was variable at best, and was *Left*, in most cases, rather than *Right* (more on this below). So in cases where there were multiple Hs in a word, it was usually the leftmost H that got primary stress, rather than the rightmost, leading to 22.79% (SD: 23) final primary stress for bisyllabic words and 16.10% (SD: 18.39) for trisyllabic words, rather than 50%. In fact, one learner, A.K. had only one word with final primary stress, since he allowed degenerate feet at the left edge, in addition to setting End-Rule to *Left*.

Despite the lower than expected number of words with word-final primary stress (because of End-Rule often being set to *Left*) for these learners, their word-final syllables at least received secondary stress about half of the time, or 52.07% (SD: 19:46) to be exact, almost all of these being words that involve a final H. Table (3) below summarizes the grammars of each subject at this stage. One learner, A.K. differs slightly from the others, allowing degenerate feet at the left edge.[6]

---

[6] It is not clear why this learner arrived at such an analysis. It could be that resetting Extrametricality from *Yes* to *No* triggered this, somehow forcing him to adopt an analysis where not only word final syllables, but *all* syllables are parsed into feet. That is, it might also be that Extrametricality is reset to *No* in two alternative ways, one by simply resetting this specific

(3) Stage 1:

Parameter	English	J.T. (Int.)	S.T. (Int.)	A.K. (Int.)	A.M. (Int.)	J.N. (Adv.)
Foot shape	Troch	Troch	Troch	Troch	Troch	Troch
Extrametricality	Yes	No	No	No	No	No
Weight-sensitivity	Yes	Yes	Yes	Yes	Yes	Yes
Boundedness	Yes	Yes	Yes	Yes	Yes	Yes
Binarity	Yes	Yes	Yes	No:Deg.Ft.	Yes	Yes
Iterativity	Yes	Yes	Yes	Yes	Yes	Yes
Direction	R-to-L	R-to-L	R-to-L	R-to-L	R-to-L	R-to-L
End Rule	Right	Variable	Left	Left	Right	Left

We will take J.T.'s grammar as an example here, and investigate it further, for it involves the lowest number of exceptions (other than variable End-Rule, see above). Table (4) below provides representative examples of J.T.'s outputs, together with the percentages of words that fall within the same pattern as the example given, as well as exceptions to it, if any. In comparing (4) with the outputs of the Stage 0 learner exemplified in (2) above, it becomes evident that a single change in the grammar from Stage 0 to Stage 1, i.e. resetting Extrametricality from *Yes* to *No*, brings about a big difference in the learner's surface forms. Since End-Rule was variable in his grammar, examples are given which are consistent with either the *Left* and *Right* setting of this parameter.

---

parameter, as the other subjects at this stage seem to have done, or two, by ranking the already high-ranking PARSE-σ even higher, thereby parsing not only word final syllables but also monomoraic syllables at the end of the parsing direction.

(4) J.T.'s grammar:

Condition	L1 (English)	Interlanguage	Percentage		Exception	Explanation
Bisyllabic words:						
a. LL	[(ké)<di>]	[(kédi)]	100%	4/4	-	
b. LH	[(çá)<tal>]	[ça(tál)]	75%	3/4	káşık	/ı/ escapes stress
c. HL	[(él)<ma>]	[(él)ma]	100%	6/6	-	
d. HH	[(bár)<dak>]	[(bár)(dàk)]	100%	6/6	-	
Trisyllabic words:						
e. LLL	[(bóya)<cı>]	[bo(yácı)]	100%	3/3	-	
f. LLH	[(kéle)<bek>]	[(kéle)(bèk)] [(dìno)(zó:r)]	80%	5/5	-	
g. LHL	[yu(múr)<ta>]	[yu(múr)ta]	100%	5/5	-	
h. LHH	[sa(rím)<sak>]	[sa(rím)(sàk)]	75%	3/4	kalemlé:r	Length+Iter: No
i. HLL	[(hém)şi<re>]	[(hém)(şìre)] [(şèm)(síye)]	75%	4/4	-	
j. HLH	(mér)di<ven>]	[(mér)di(vèn)] [(pòr)ta(kál)]	83%	6/6	-	
k. HHL	[(şèm)(pán)<ze>]	[(şèp)(pán)ze] [(dón)(dùr)ma]	80%	4/5	-	
l. HHH	[(dèf)(tèr)<ler>]	[(dèf)(tèr)(lér)] [(yíl)(dìz)(là:r)]	83%	5/6	-	

J.T. constructed right-to-left iterative binary moraic trochees. That, when heavy, his final syllables bore (at least secondary) stress is evidence that Extrametricality, in J.T.'s grammar, was reset to *No*. Initial stress in LL and HL forms should, then, be an indication of trochaic foot shape, not, for example, of Extrametricality. A comparison of LL and HL with LH and HH forms reveals, further, that his trochees are weight-sensitive, for the (final) H attracts stress, when available. Further, that stress falls on the second L in LLL forms indicates that parsing is right-to-left: [L(ĹL)] When there are more than three moras in a given word, more than a single binary foot is created, as is clear from the presence of secondary stress in such words, which indicates that Iterativity is still set to *Yes* for this learner. Finally, the fact that, in these cases, sometimes the head of the rightmost foot and sometimes the head of the leftmost receives primary stress is evidence that End-Rule is variable.

That End-Rule, at this stage, was variable for J.T., and set to *Left* for some other subjects, was not expected on the current account, especially given the assumption made in Chapter 3 that End-Rule is *Right* in English; no prediction for the switching of End-Rule to *Left* was made for Turkish, since final prominence in Turkish can only be arrived at through stressing the final syllable, that is by keeping the *Right* setting of End-Rule, not by resetting it to *Left*.

Thus, switching End-Rule to *Left* appears puzzling at first. However, the unified analysis of Turkish stress/prominence, outlined in Chapter 2, presents a potential explanation for this behavior. End-Rule, in L1 Turkish, is, in fact, set to *Left* on the analysis proposed in Chapter 2, though this is relevant only in cases where there is an underlying foot since feet, in Turkish, can be parsed only through Faithfulness to underlying foot edges. Given the PAPH prediction that English learners will parse feet across the board, that is, not only when an exceptional suffix is available, learners attentive to this rule might be applying it more generally, to all Turkish words, whether they involve exceptional morphemes or not. This, in turn, could result in End-Rule being switched from *Right* to *Left* at this stage, where the learners have analyzed enough input from exceptionally stressed morphemes.

Another fact, in support of this position, is that in English itself, End-Rule does not seem to be always *Right*, despite the common assumption made by standard accounts (e.g. Halle & Vergnaud, 1987; Hayes, 1995). Alcantra (1998), for example, showed, based on the corpus data of Baayen, Harald, Piepenbrock, & Gulikers (1993), that 33% of English words with the weight profile of HHH bear primary stress on their first syllable, not the second; only 53% of these words are stressed on their second syllable (and the rest, 14%, on the third, which probably involve cases with no extrametricality, or no syllable extrametricality; see discussion at end of 6.3.1.1). Likewise, 35% of HHL words in English, according to the same study, bear primary stress on their first syllable (whereas 62% are stressed on the second). In light of these facts, it does not look like English stress itself has End-Rule set to *Right* at all times, despite the common assumption. In fact, *Left* was the original setting for End-Rule in Old English, and though many of these words still have their original stress pattern, borrowings from Latin led to a different analysis of all English words, including those with initial stress (Dresher & Lahiri 2005). It is possible, therefore, that End-Rule is *Right* in English, but lexically encoded as *Left* in some forms. This fact, together with the fact that End-Rule is *Left* in Turkish for exceptional stress, could explain why some learners set End-Rule to *Left*.[7]

Finally, note that though transfer effects are very clear in these learners' grammars, transfer is not at the surface level. In other words, it is not that these subjects are transferring the L1 stress patterns, using a specific template or something to that effect; rather, they are transferring parameter settings. In doing so, not all parameter settings are transferred, resulting in a grammar which is neither like the L1 nor the L2, but one that is possible given the scope of options provided by UG. Further, it is clear that these learners are not simply using a metalinguistic or pedagogical strategy in arriving at such interlanguage grammars;

[7] In addition, it could be that the fact that PPh-level stress falls on the leftmost PWd in a PPh in Turkish (see Chapter 2) has led to such an analysis on the part of some learners.

for example, J.T. is able to stress final Hs, not through the application of a conscious learning strategy such as one that says all final Hs should be stressed, but rather via resetting Extrametricality. A conscious learning strategy would, first of all, not explain why the second L, in LLL forms, is stressed, which is neither like the L1 (where the first L is stressed), nor like the L2 (where the third L gets prominence). Second, there seems to be no reason for a learner to employ such a conscious learning strategy which leads to only partially target-like behaviour.

6.3.1.3 Stage 2: Reset Extrametricality (Stage 1), together with word final vowel-lengthening

The word shapes that are problematic above, at Stage 1, are those that involve final Ls, for final Hs can form a foot by themselves and head it in a weight-sensitive grammar, and thus bear stress, even when the grammar is trochaic. If, in addition to resetting Extrametricality from *Yes* to *No*, a learner lengthens all final vowels (see Strategy 2 in Chapter 4), all final Ls would be turned into Hs, and they would thereby head their own feet, leading to higher percentages of final stress.

There was one learner tested in the experiments, J.D., an intermediate-level learner, who fit into this category. He had a trochaic grammar, yet, he also lengthened the final syllable of almost every experimental word, in particular those ending in an L, thereby turning them all into Hs (though, see below, for an alternative, iambic analysis). Since, as with L1 English, the grammar of this learner still had Weight-Sensitivity set to *Yes*, and End-Rule to *Right*, almost all his words ended in a syllable that bore primary stress. He had 100% success rate on the surface with respect to primary stress in bisyllabic words, and 72.97% in trisyllabic words (lower here due to End-Rule being sometimes *Left*). As expected by the PAPH, however, J.D. could still not rid his grammar of Iterativity, a parameter that was hypothesized only to be reset at later stages (see Chapter 4); it is not, therefore, likely for this parameter to be reset at a stage when the grammar is still trochaic.

Table (5) below presents a summary of J.D.'s grammar. Note that this is the same as the grammar of J.T. from the previous stage, except that J.D. is less faithful to the underlying duration of final syllables of Turkish words, and is, therefore, more target-like, on the surface, with respect to Turkish final "stress."

(5) Stage 2:

Parameter	English	J.D. (Intermediate)
Foot shape	Trochaic	Trochaic
Extrametricality	Yes	No
Weight-sensitivity	Yes	Yes
Boundedness	Yes	Yes
Binarity	Yes	Yes
Iterativity	Yes	Yes
Direction	R-to-L	R-to-L
End Rule	Right	Right (with some exceptions)

Table (6) below presents examples to J.D.'s outputs under all experimental conditions. Notice that there are no words here in LL, HL, and LLL conditions and only one word in each of LHL, HLL, and HHL, words that end in an L (thus listed as exceptions). The final Ls in these conditions were changed into Hs. In other words, target LL, HL, LLL, LHL, HLL, and HHL forms were respectively produced as LH, HH, LLH, LHH, HLH and HHH, thereby increasing the number of words in the latter conditions. Examine (6):

(6) J.D.’s grammar:

Condition	L1 (English)	Interlanguage	Percent.		Exception	Explanation
Bisyllabic words:						
a. LL	[(ké)<di>]	none (see LH)	-	-	-	
b. LH	[(ká)<şık>]	[ka(şík)] [ça(tá:l)] [ke(dí:)]	90%	9/10	kòpék	Degenerate Ft.
c. HL	[(él)<ma>]	none (see HH)	-	-	-	
d. HH	[(bár)<dak>]	[(bàr)(dá:k)] [(àr)(mút)] [(èl)(má:)]	100%	10/10	-	
Trisyllabic words:						
e. LLL	[(bóya)<cı>]	none (see LLH)	-	-	-	
f. LLH	[(tébe)<şir>]	[(tèbe)(şí:r)] [(bòya)(cí:)]	67%	6/9	kélebèk árabà:	EndRule: Left
g. LHL	[yu(múr)<ta>]	none except one (see LHH)	-	0/1	hedí:ye	One LLL, *hediye*, turned into LHL
h. LHH	[sa(rím)<sak>]	[ki(tàp)(lár)] [yu(mùr)(tá:)	64%	7/11	tamí:rcì: kàlèmlé:r tekérlek	-EndRule: Left -Degenerate Ft. -Extramet:Yes or WS:No
i. HLL	[(şàr)kı<cı>]	none except one (see HLH)	-	0/1	şèmsíye	All HLL turned into HLH, except for *şemsiye*
j. HLH	[(pór)ta<kal>]	[(pòr)ta(ká:l)] [(şàr)kı(cí:)]	86%	6/7	mérdivè:n	EndRule: Left
k. HHL	[(şèm)(pán)<ze>]]	none except one (see HHH)	-	0/1	hèmşí:re	One HLL, *hemşire*, turned into LHL.
l. HHH	[yìldíz<lar>]	[(yìl)(dìz)(lá:r)] [(òğ)(rèt)(mén)] [(şim)(pàn)(zé:)]	83%	6/7	dóndùrmà:	EndRule: Left

Looking only at the bisyllabic outputs of J.D., one could get the impression that his grammar is iambic, i.e. with iambic lengthening. Though such an analysis is still possible (see below), his performance in the LLH condition makes his grammar look more trochaic. In addition to stressing the last H of the words in this condition, J.D. also put secondary stress on the first L, but not on the second, indicating that his grammar was still trochaic: [(L̀L)(H́)]. Notice that though only 67% of the time his utterances in this condition strictly followed this pattern, the exceptions are still in line with a trochaic analysis; they are listed as exceptions here, only because they involve End-Rule being *Left*, instead of *Right*, and primary stress, for this reason, falls on the head of the first, rather than the last, foot. In fact, all his exceptions, including those where word final vowels were not lengthened (see e.g. [(*şèm*)(*síye*)]) are in line with a trochaic analysis of his grammar.

Note that J.D. also lengthened vowels before word-final codas, though this was not as prevalent as open syllable lengthening. Crucially, however, he did not lengthen vowels bearing secondary stress, so an iambic analysis on these grounds is not possible (i.e. it is not that all heads of feet are lengthened). J.D. also had a couple of words with degenerate feet at the left edge (see [(kò)(pék)] and [(kà)(lèm)(lé:r)] listed under the exceptions column), which presents evidence that the direction of footing, in his grammar, was Right to Left, as in the L1. Note that without these two words, it would not be possible to have this information, for word final lengthening essentially ensures that no 3 Ls (i.e. LLL) are next to each other; that is, it would not, otherwise, be possible to see at which edge of a word an unparsed (or monomoraically parsed) syllable is located.

Despite the trochaic analysis that was put forth here, an alternative, iambic, analysis of these data is also available. Notice that the trochaic analysis was based, in large part, on the behaviour of the words in the LLH condition, which were stressed not only on their final syllable, but also on the initial L. This was the decisive factor between an iambic and a trochaic analysis, in favour of the latter. The rest of the data is equally consistent with an iambic analysis, and, in fact, given word-final lengthening, the balance between the two is changed in favour of an iambic analysis, since the rest of the data can all be captured with weight-sensitive iambs, e.g. [(LH́)], [(LH̀)(H́)], [(H̀)(LH́)]. If the LLH data can also be fit under an iambic analysis, an iambic analysis of J.D.'s grammar becomes all the more reasonable. In fact, this is possible, if we also assume that J.D. allows degenerate feet. Under such an analysis, his grammar would involve right-to-left weight-sensitive iambs, where an L at the left edge that cannot fit in the dependent position of a foot is parsed in a degenerate foot: [(L̀)(LH́)]. Such an analysis would be consistent with the rest of the data, too, but would crucially require right-to-left parsing, which is marked for iambic languages, in addition to the separately marked status of degenerate feet. Further, a trochaic analysis of the data is easier to reach given the starting point of English-speaking learners, since that involves fewer changes in the grammar, and is still consistent with the data. Given these, I will go with the trochaic analysis, but keep in mind that an iambic analysis is completely possible, too.[8]

Note, finally, that word-final lengthening is a phenomenon not just restricted to iambic languages; the process is attested in many languages throughout the world including trochaic languages (see Myers & Hansen 2007 for some examples). That is, J.D.'s grammar has all the properties of a natural

---

[8] On the other hand, given that a learner, A.K., of the previous stage had leftmost degenerate feet (see note 6), it is possible that there are two different paths following from Stage 1, and that J.D. and A.K. are following the same path, with J.D. being at a later (more advanced) stage than A.K. That is, it could be that, for learners who got rid of extrametrical final syllables in ways done by A.K. at the previous stage, the next stage is like that of J.D. (iambic with degenerate feet), whereas for the other learners at the previous stage, the next stage would be an iambic stage without degenerate feet, as we will see below.

language, a natural language that is neither like the L1 (in that word-final syllables are footed), nor the L2 (e.g. that secondary stress is allowed). It is also consistent within itself, and is not, by any means, a rogue grammar. This analysis was reached, I assume, through following the options made available by UG; it could not have been reached through the L1 alone, or through the L2 input alone, as with the Stage 1 grammars covered above.

6.3.1.4 Stage 3: Reset Extrametricality (Stage 1) and Head from *Left* to *Right*

At Stages 1 and 2, where Extrametricality was reset from *Yes* to *No*, final Hs could be stressed, but final Ls could not. That was the problem faced by Stage 1 and 2 learners, as far as final stress is concerned. If, in addition to resetting Extrametricality from *Yes* to *No*, a learner reset Headedness from *Left* to *Right* (i.e. from trochaic to iambic), and kept the L1 values of all other parameters, he or she could attain higher levels of final stress/prominence since final Ls, as with final Hs, would, then, bear stress. This, of course, excludes cases where a final L is immediately preceded by an H, in which case, stress would fall on the H since Weight-Sensitivity is still set to *Yes*. That is, the same parameter, Weight-Sensitivity, that ensured final stress in *some* cases in trochaic grammars (i.e. cases ending in an H) would now lead to nonfinal stress in some cases in iambic grammars, i.e. cases where a final L is immediately preceded by an H. Nevertheless, a learner at this stage would still do better than a Stage 1 learner since final stress will be achieved not only in conditions ending in an H, but also those that end in an L preceded by another L (i.e. LL, LLL and HLL), that is in 9 conditions out of 12, leading to about 75% success rate for final stress/prominence.

There was one learner tested in the study who showed characteristics of such a stage, A.B., an intermediate learner of Turkish. Almost all of A.B.'s outputs were consistent with an iambic analysis, with Extrametricality set to *No*, Weight-Sensitivity to *Yes* and End-Rule to *Right*. Table (7) below summarizes her grammar.

(7) Stage 3:

Parameter	English	A.B. (Intermediate)
Foot shape	Trochaic	Iambic
Extrametricality	Yes	No
Weight-sensitivity	Yes	Yes
Boundedness	Yes	Yes
Binarity	Yes	Yes
Iterativity	Yes	Yes
Direction	R-to-L	R-to-L or L-to-R
End Rule	Right	Right

As seen, only two parameters, Foot-Shape and Extrametricality - which are both terminal in the parameter tree proposed in (2) in Chapter 4 - differ from L1 English with respect to their values. Notice that parameters with embeddings, i.e. Iterativity and Boundedness, stay set to *Yes*, as predicted by the PAPH.

Table (8) below presents examples from A.B.'s outputs, together with the percentage of words that fell into the exemplified pattern (and any exceptions, if present):

(8) A.B.’s grammar:

Cond.	**L1 (English)**	**Interlanguage**	**Percentage**		**Exceptions**	**Explanation**
Bisyllabic words:						
a. LL	[(ké)<di>]	[(kedí)]	100%	5/5	-	
b. LH	[(bí)<ber>]	[(bibér)]	80%	4/5	çátəl	Extrametr:Yes or Troch
c. HL	[(él)<ma>]	[(él)ma]	100%	4/4	-	-
d. HH	[(ár)<mut>]	[(àr)(mút)]	80%	4/5	bárdàk	EndRule:Left
Trisyllabic words:						
e. LLL	[(hédi)<ye>]	[he(diyé)]	67%	2/3	kayísı	Extrametr:Yes or Troch, or L-to-R iamb
f. LLH	[(tébe)<şir>]	[(tebè)(şír)]	100%	4/4	-	-
g. LHL	[yu(múr)<ta>]	[(yumúr)ta]	100%	4/4	-	-
h. LHH	[ka(lém)<ler>]	[(kalèm)(lér)] [(çiçèk)(cí:)] [(sürǜ:)(cǘ:)]	100%	8/8	-	-
i. HLL	[(şém)si<ye>]	[(şèm)(siyé)]	100%	3/3	-	-
j. HLH	[(pór)ta<kal>]	[(pòr)(takál)] [(sàr)(kıcí:)]	80%	4/5	éldivèn	EndRule:Left
k. HHL	[(ö̀ğ)(rén)<ci>]	(ö̀ğ)(rén)ci]	100%	2/2	-	-
l. HHH	[(bày)(rák)<lar>]	[(bày)(ràk)(lár)] [(kàn)(gù:)(rú:)] [(dòn)(dùr)(má:)]	89%	8/9	déftèrlèr	EndRule:Left

A comparison of LL and HL forms indicates that A.B. had weight-sensitive iambs, for the syllable bearing weight was stressed if one was available, and the final L if not. If Weight-Sensitivity was set to *No*, the final L would be stressed in HL and all other words ending in an L, thereby leading to higher success rates on the surface with respect to final stress. This was not the case, however, despite the fact that Weight-Sensitivity, on the PAPH, is a terminal parameter (see (2) in Chapter 4), which is expected to be relatively easy to reset (more on this below, where this is linked to a universal prohibition against the weight-insensitive iamb).

A few things in A.B.’s grammar do not look like a typical iambic grammar. First, though the typical iamb is constructed from *Left* to *Right* (Kager 1993, Hayes 1995), an examination of A.B.’s LLL forms reveals that Directionality was from *Right* to *Left*, since the final L was stressed in words in this condition: [L(LĹ)]. If Directionality was *Left* to *Right*, stress would fall on the second L since this syllable would, then, be the head of an iamb constructed from the left edge of a word: [(LĹ)L]. On the other hand, the evidence for this, which comes exclusively from the LLL forms, is rather weak, since only three LLL forms were produced, and only two of them are consistent with a right-to-left analysis, e.g. [he(diyé)]. The third one, *kayísı* cannot be achieved with right-to-left parsing; it is, rather, consistent with a left-to-right analysis: i.e. [(kayí)sı], assuming that, this, too, is an iamb (rather than, e.g. exceptionally constituting a trochee, i.e. [ka(yísı)]). Further, one LLL form, *sürücü*, was lengthened on its second and third syllables (see (8h)), as well as bearing stress on these syllables, effectively reflecting a phenomenon occurring commonly in left-to-right iambic languages (since heads are typically lengthened in iambs and lengthened syllables here are heads only on a left-to-right analysis). Finally, and perhaps most importantly, the stress pattern of LLH forms in (8f) does not seem to be consistent with right-to-left footing, which would predict [L(LH́)], not [(LL̀)(H́)] for weight-sensitive iambs (more on this below). In sum, the data are conflicting at best, with respect to Directionality, but even if it were to be right-to-left, as proposed here in (8), right-to-left iambic languages are attested, if not as commonly as their left-to-right counterparts. Hayes (1995), for example, analyzes Tübatulabal (Wheeler 1979), Aklan (Hayes 1981), and Tiberian Hebrew (McCarthy 1979) as iambic, with right-to-left parsing.

As has just been mentioned, the forms in (8f) are potentially problematic, on the assumption that A.B.'s iambs were constructed from right-to-left, for that would predict [L(LH́)], and not [(LL̀)(H́)]. That the latter, rather than the former, parsing arose could, however, be attributed to the high-ranking status of PARSE-σ, the requirement that all syllables be parsed into feet. PARSE-σ ranked high for one of the Stage 1 learners, A.K. too (see note 6), as well as, potentially, for the Stage 2 learner analyzed in (6), if his grammar is taken to be iambic (see note 8). Since, in A.B.'s grammar, Binarity and Weight-Sensitivity are even more important (than PARSE-σ), all syllables were parsed into feet only in cases when that would not lead to a degenerate or weight-insensitive foot, which is why the first syllable in (8e) and the last syllable in (8c) are unfooted, despite high-ranking PARSE-σ. In other words, the rule in this learner's grammar is that all syllables are parsed from right-to-left into weight-sensitive binary feet. A syllable is not, therefore, parsed if such parsing is going to place it in a weight-insensitive or degenerate foot.

All this being said, a left-to-right analysis is possible, too, especially given the lack of strong evidence for right-to-left parsing (see above). This would result in an iambic grammar that is less marked, but would differ more from the L1 grammar. So given A.B.'s starting point, the L1 English grammar, the parses proposed in (8) above seem more plausible, despite being more marked. The parses under the alternative analysis, which assume left-to-right parsing, are presented in (9) below, together with exceptions to this particular pattern. Note especially (9e); what was the regular pattern in (8e) becomes an exception here, and vice versa.

(9) A.B.'s grammar: alternative analysis (compare with (8))

Cond.	L1 (English)	Interlanguage	Percentage		Exceptions	Explanation
Bisyllabic words:						
a. LL	[(ké)<di>]	[(kedí)]	100%	5/5	-	
b. LH	[(bí)<ber>]	[(bibér)]	80%	4/5	çátəl	Extrametr:Yes or Troch
c. HL	[(él)<ma>]	[(él)ma]	100%	4/4	-	-
d. HH	[(ár)<mut>]	[(àr)(mút)]	80%	4/5	bárdàk	EndRule:Left
Trisyllabic words:						
e. LLL	[(hédi)<ye>]	[(kayí)sı]	33%	1/3	hediyé	R-to-L iamb
f. LLH	[(tébe)<şir>]	[(tebè)(şír)]	100%	4/4	-	-
g. LHL	[yu(múr)<ta>]	[(yumúr)ta]	100%	4/4	-	-
h. LHH	[ka(lém)<ler>]	[(kalèm)(lér)] [(çiçèk)(cí:)] [(sürǜ:)(cǘ:)]	100%	8/8	-	-
i. HLL	[(şém)si<ye>]	[(şèm)(siyé)]	100%	3/3	-	-
j. HLH	[(pór)ta<kal>]	[(pòr)(takál)] [(sàr)(kıcí:)]	80%	4/5	éldivèn	EndRule:Left
k. HHL	[(ö̀ğ)(rén)<ci>]	(ö̀ğ)(rén)ci]	100%	2/2	-	-
l. HHH	[(bày)(rák)<lar>]	[(bày)(ràk)(lár)] [(kàn)(gù:)(rú:)] [(dòn)(dùr)(má:)]	89%	8/9	déftèrlèr	EndRule:Left

Under either analysis, as can be seen from most trisyllabic words, footing was iterative since, whenever possible, more than a single syllable was stressed, indicating that multiple feet were created.

All in all, at this stage, where foot shape was reset from *Left* to *Right*, together with a change in Extrametricality from *Yes* to *No*, all final Hs, as well as final Ls, unless they were immediately preceded by an H, were stressed, resulting in a large number of words with final primary stress (63.16% for bisyllabic, and 62.86% for trisyllabic words).

The problem at that stage is with Weight-Sensitivity; since this parameter is still set to *Yes*, as in the L1, when a final L immediately follows an H, the H attracts stress, and the L cannot bear stress by itself since feet must be binary.

If, in addition to changing Head from *Left* to *Right*, a learner changed Weight-Sensitivity from *Yes* to *No*, no such problems would remain, and all word-final syllables would, then, be stressed, whether they are L or H, as long as the direction of foot construction remains *Right* to *Left*, as in the L1; i.e. a stage corresponding to the Strategy 4 in Chapter 4 would result. Such a stage should be possible given that Weight-Sensitivity is a terminal parameter (see (2) in Chapter 4), and that resetting terminal parameters should, on the PAPH, be relatively easy. No such learners have, however, been found to exist in this study. None of the learners tested reset Weight-Sensitivity from *Yes* to *No* (see Section 6.3.3 below for a detailed discussion of this issue).

Instead, some learners resorted to "iambic lengthening," especially in word final syllables, which, essentially, had the same effect as resetting Weight-Sensitivity from *Yes* to *No* would have had, in that this also made every word-final syllable stressable, not by turning the language into one that is weight-insensitive, but by turning all final Ls into Hs, which could, then, be stressed in a weight-sensitive grammar. These learners will be the subject of the next section. It should be mentioned, before moving on to this section though, that A.B. also had some forms with what looked like iambic lengthening; for example, two LHL were changed into LHH, two HLL into HHH, one HLL into HLH, two HHL into HHH, and one LLL into LHH (see table (8) or (9)). It seems, from these patterns, that she was, in fact, in transition from Stage 3 to Stage 4, where final L-lengthening occurred, which, in turn, increased the number of words with final stress.

6.3.1.5 Stage 4: Reset Extrametricality from *Yes* to *No* and Head from *Left* to *Right* (Stage 3) and Final Lengthening

As was mentioned above, no iambic learners who reset Weight-Sensitivity from *Yes* to *No* were found in this study, even though doing so would result in 100% "success" rate with respect to final stress. What some learners did, instead, was to lengthen the final vowel of prosodic words, which, essentially, had the same effect as resetting Weight-Sensitivity from *Yes* to *No* would have had, as far as final stress is concerned. This option, however, results in more violations of Iterativity on the surface, by means of creating an extra mora (i.e. through vowel lengthening), which, in the absence of resetting Iterativity from *Yes* to *No*, increased the number of words bearing secondary stress on the surface.

Three learners were found to belong to this stage, D.C., N.C. and C.L. Table (10) below provides a summary of the parameter settings of each subject at this stage. Note that the direction of foot construction is not very clear, at least for two of the learners, since, at least on one interpretation of the data, all syllables are within a binary foot (due to final lengthening), leaving us no clear way to determine the direction of footing, since no syllable, on that interpretation, is left unparsed or is parsed into a degenerate foot. On the other hand, for one of the learners, D.C., the learner to be analyzed here, we have evidence that it is left-to-right (more on this below).[9]

---

[9] Note, however, that, in the unmarked case, the setting of End-Rule in a language corresponds to the direction where foot construction begins (Hammond 1985). So if, in a language, foot construction is left-to-right, End-Rule will tend to be set to *Left*; conversely, if foot construction is right-to-left, End-Rule will usually be set to *Right*. Although this is the unmarked case (in terms of frequency), it is not universal according to Kager (1995); several languages including Creek (Hayes 1981), Wargamay (Dixon 1981) and Cayuga (Foster 1982) show the opposite pattern. In addition, in the current case, given learners' starting point (i.e. that End-Rule is set to *Right* in

(10) Stage 4:

Parameter	English	D.C. (Int.)	N.C. (Adv.)	C.L. (Int.)
Foot shape	Trochaic	Iambic	Iambic	Iambic
Extrametricality	Yes	No	No	No
Weight-sensitivity	Yes	Yes	Yes	Yes
Boundedness	Yes	Yes	Yes	Yes
Binarity	Yes	Yes	Yes	Yes
Iterativity	Yes	Yes	Yes	Yes
Direction	R-to-L	L-to-R	L-to-R or R-to-L	L-to-R or R-to-L
End Rule	Right	Right	Right	Right
Final lengthening	No	Yes	Yes	Yes

All in all, 90% of these subjects' bisyllabic outputs and 82.19% of trisyllabic outputs had final stress, and 77.03% of all outputs had Iterativity. That is, though they were target-like with respect to final stress, they had even more problems than the previous stage as far as Iterativity was concerned. However, this is simply because their utterances were longer in that they contained an extra mora because of final lengthening (and in the case of one learner, D.C., nonfinal iambic lengthening, too). Table (11) below illustrates the pattern exhibited by the words produced at this stage, focusing on D.C.'s grammar. D.C. lengthened the final vowel of almost every word, as well as sometimes lengthening the heads of nonfinal iambs. Notice that some of the conditions do not surface because of vowel lengthening; LL, for example, turned into LH as an effect of final lengthening. Because of this, an example is provided, under LH in (11), for both

---

English), there is no reason to assume that they will switch End-Rule to *Left* since input from Turkish does not favour this either, even though this will lead to a possibly marked (but not impossible) grammar, assuming that foot construction is left-to-right.

underlying LH and LH derived from LL. The same is done for the other conditions where vowel lengthening took place.

(11) D.C.'s grammar

Condition	**L1 English**	**Interlanguage**	**Percentage**		**Exception**	**Explanation**
Bisyllabic words:						
a. LL	[(gé)<mi>]	none (see LH)	-	-	-	
b. LH	[(bí)<ber>]	[(bibér)] [(gemí:)]	100 %	7/7	çátəl	Extrametr: Yes or Troch
c. HL	[(èl)<ma>]	none except one (see HH)	100 %	0/1	sílgi	All HL turned into HH, except for *silgi*
d. HH	[(ár)<mut>]	[(ár)(mút)] [(mày)(mú:n)] [(èl)(má:)]	100 %	12/12	-	
Trisyllabic words:						
e. LLL	[(káyı)<sı>	none (see LHH & LLH)	-	-	-	All LLL turned into LHH or LLH
f. LLH	[(óto)<büs>]	[(otò)(bǘ:s)] [(kayì)(sí:)]	100 %	3/3	-	(Most underlying LLHs turned into LHH)
g. LHL	[yu(múr)<ta>]	none (see LHH)	-	-	-	
h. LHH	[ka(lém)<ler>]	[(kalèm)(lé:r)] [(çiçèk)(çí:)] [(kelè:)(bék)] [(sürǜ:)(cǘ:)]	81%	13/16	kitá:pçì: yumurtá:	-EndRule: Left -Iterativity: No
i. HLL	[(hém)si<re>]	none except one (see HLH)	-	0/1	şèmsíye	All HLL turned into HLH, except for *şemsiye*
j. HLH	[(pór)ta<kal>]	[(pòr)(takál)] [(hèm)(şiré:)]	75%	6/8	eldivén şárkıcì:	-Iterativity: No -EndRule: Left
k. HHL	[(dòn)(dúr)<ma>]	none (see HHH)	-	-	-	
l. HHH	[(yìl)(díz)<lar>]	[(yìl)(dìz)(lá:r)] [(dòn)(dùr)(má:)]	89%	8/9	óğrè:tmèn	EndRule: Left

Although several different analyses of these data are possible, I will analyze them as weight-sensitive iambs, constructed from left-to-right, as this is the least marked and most widely-attested iambic system (Hayes 1995), and is consistent with the data. Although a right-to-left analysis is also technically possible, assuming that the lengthening pattern we observe in the data is iambic lengthening, a left-to-right analysis is superior. On a right-to-left analysis, LLL forms would surface as [(H)(LH)], rather than the observed pattern [(LH)(H)].

Assuming that foot construction is left-to-right, and that feet are weight-sensitive, every second syllable, starting from the left edge will be stressed, unless the first syllable is heavy, in which case, this syllable is stressed, and foot construction continues with the syllable to the right. That is, heavy syllables have to be in head position, ideally of a bisyllabic foot, resulting in an uneven iamb (i.e. [(bi.bér)]), but if the heavy syllable is initial, in order to satisfy Weight-Sensitivity, this syllable constitutes a foot by itself (i.e. [(pòr)(ta.kál)] - avoiding, e.g. *[(por.tà)(kál)], the first foot of which is weight-insensitive. If the only syllable that is left, at the end of foot construction, is an H, this syllable, similarly, heads its own foot, as in [(kelè:)(bék)]. All things considered, these learners' iambs look very much like dialects of Ojibwa (see e.g. Bloomfield 1939, Piggott 1980, 1983), which, similarly, have left-to-right weight-sensitive iambs, which are ideally bisyllabic, but in case this violates Weight-Sensitivity, a single H forms an iambic foot (instead of being in the dependent position of a bisyllabic foot), leading to every H receiving, at least, secondary stress on the surface.

Note also that feet are still iterative at this stage, as is clear from the fact that whenever a word is long enough, secondary stress is observed. Finally, End-Rule is set to *Right*, since when multiple feet are available, the rightmost foot receives primary stress (see also note 9). The biggest problem, on the surface, for a learner at this stage is Iterativity, which stays set to *Yes*, as in the L1, despite changes in the values of several other parameters.

6.3.1.6 Stage 5: Reset Extrametricality from *Yes* to *No*, Head from *Left* to *Right*, with Final Lengthening (Stage 4) and Iterativity from *Yes* to *No*

One of the predictions of the PAPH was that Iterativity would be a very difficult parameter to reset to *No*, given that it has other parameters embedded underneath it in the parameter tree in (2) in Chapter 4. It was predicted in the same chapter that only very advanced learners, if any, would be able to do this. This prediction was borne out. Only one subject, M.F., the most advanced among all the subjects tested, seemed to have started to rid his grammar of Iterativity, as indicated by the fact that most of M.F.'s outputs did not have secondary stress; in particular, only 20.69% of his utterances had iterative stress, although almost all of his outputs, except those in the LL and LH conditions, could have accommodated more than one foot, especially given that he had final lengthening (as with learners at the previous stage), thereby increasing the number of moras in a word and thus the possibility of multiple stresses. Therefore, Iterativity was (in the process of being) reset from *Yes* to *No*. Table (12) below summarizes M.F.'s grammar. Note that settings of some of the other parameters cannot be determined from the data available (more on this below):

(12) Stage 5:

Parameter	English	M.F. (F)
Foot shape	Trochaic	Iambic
Extrametricality	Yes	No
Weight-sensitivity	Yes	Yes (with some exceptions)
Boundedness	Yes	Not clear, assumed to be Yes
Binarity	Yes	Not clear, assumed to be Yes
Iterativity	Yes	No (with partial variability)
Direction	R-to-L	R-to-L
End Rule	Right	Right (though vacuously satisfied in most cases since there is a single foot)
Final lengthening	No	Yes (with partial variability)

(13) below provides examples from M.F.'s outputs for each condition tested in the study, as well as percentages showing what proportion of the words in the relevant condition followed the pattern represented by the example:

(13) M.F.’s grammar:

Cond.	L1 (English)	Interlanguage	Percentage		Exception	Explanation
Bisyllabic words:						
a. LL	[(pá)<ra>]	none except one (see LH)	-	0/1	kédi	All LL turned into LH, except for *kedi,* which was troch or involved Extram
b. LH	[(çá)<tal>]	[(çatá:l)] [(kaşík)] [(pará:)]	100%	9/9	-	-
c. HL	[(èl)<ma>]	none except two (see HH)	-	0/2	ayná, silgí	All HL turned into HH, except for *ayna* and *silgi*
d. HH	[(táv)<şan>]	[tav(şá:n)] [el(má:)]	50%	4/8	bàrdá:k	Iterativity: Yes
Trisyllabic words:						
e. LLL	[(boya)<cı>]	bo(yací)	100%	3/3		Other LLLs turned into LLH
f. LLH	[(tébe)<şir>]	ke(lebék) te(lefó:n) sü(rücű:)	100%	5/7	otòbűs	Iterativity: Yes
g. LHL	[yu(múr)<ta>]	none except two (see LHH)	-	0/2	karínca, kitápçı	All LHL turned into LHH, except for *karınca* and *kitapçı,* which both had non-final stress.
h. LHH	[ka(lém)<ler>]	[kalem(lé:r)] [örüm(cék)] [yumur(tá:)]	81%	5/7	çiçékcì:	Iterativity: Yes; EndRule:Left
i. HLL	[(şém)si<ye>]	none except one (see HLH)	-	0/1	şemsiyé	All HLL turned into HLH, except for one.
j. HLH	[(pór)ta<kal>]	[por(takál)] [kan(gurú:)]	71%	5/7	è:ldivé:n	Iterativity: Yes
k. HHL	[(dòn)(dúr)<ma>]	none	-	-	-	All HHL turned into HHH
l. HHH	[(yìl)(díz)<lar>]	[yıldız(lá:r)] [defter(lér)] [dondur(má:)]	55%	6/11	dòktòrlá:r bayrá:klar	-Iterativity: Yes -Extrametr: Yes

As is clear from (13), almost all of M.F.’s outputs had final stress, with a handful exceptions. And there were only a few words with secondary stress. Also, most of the time, word-final syllables were lengthened, although this was not as prevalent as it was at the previous stage (see e.g. D.C. of Stage 4). Based on these observations, it can be stated that M.F. had non-Iterative weight-sensitive iambs, with right-to-left foot construction.

Most of the exceptions given in (13) fall into two general categories: one, word-final syllables are *not* lengthened for some words, and two, some words still have iterative foot construction. Out of these two, the first set of exceptions, i.e. lack of word-final lengthening, makes M.F.'s grammar sound more native-like since he can, in some cases, have final prominence without resorting to lengthening word-final syllables (e.g. *ayná*, *silgí*), as in L1 Turkish (more on this below). Note though that lack of final lengthening resulted in exceptions with nonfinal stress in many other cases (see e.g. *kédi*, *karínca*, *şèmsíye*). The second type of exceptions, having some words with secondary stress, is an indication that some of the effects of Iterativity are still in place at this stage, providing further support that Iterativity is a very difficult parameter to reset.

The few exceptions with final prominence without final lengthening are, in fact, what look like footless outputs, especially given their flat phonetic profile, in terms of intensity and, partially, duration. In addition, M.F. had some words in other conditions, too (e.g. LH, LLH) which were consistent with a footless analysis in terms of their phonetic profile. In total, 12.07% of his outputs (7 out of 58) were consistent with such an analysis. These facts could indicate that getting rid of the Foot, too, is not impossible, but is rather extremely difficult, something to be achieved only by near-natives, contra the PAPH proposal that this should be impossible. On the other hand, it is not possible to make any further conclusions from these forms at this point, given how only a few outputs were of this type, and given that when M.F. did not lengthen final open syllables, this sometimes resulted in exceptional non-final stress (e.g. *karínca*, *kitápçı*), rather than final prominence.

Finally, notice that the status of some of the parameters, i.e. Boundedness and Binarity, is not clear, since, in most cases, M.F. has only one stressed syllable, the word-final syllable. It is, thus, not evident, in the absence of multiple stressed syllables, whether word-final stress was attained via an unbounded foot that covers the entire word or a binary bounded foot located at the right edge that includes only the last two syllables or moras. Consider the word *por.ta.kál*, for instance. The final stress in this word can be captured with either (i) an unbounded iamb or (ii) a binary syllabic iamb, which are respectively exemplified below in (14a) and (14b).

(14) a. (por.ta.kál)

b. por.(ta.kál)

As can be seen in (13), I have opted to go with the (14b) analysis in these cases; though there is no good evidence to choose one over the other based only on the stress pattern of this single word, it is evident, from occasional iterative outputs by M.F., that his feet are probably still binary. Further, the fact that the L1 is a language that is binary, and that (14b) poses no need to change that analysis makes this a more economical option for the learner. Finally, it was hypothesized that Iterativity, on the PAPH, is an easier parameter to reset than Boundedness.

All in all, the English-speaking subjects' grammars were consistent with the PAPH. Though none of the subjects were able to rid their grammar of foot structure (except partially for M.F.), they were able to make a number of changes to the L1 grammar, on the basis of the ambient input, and, as a result, attained grammars, all constrained by UG, which were neither like the L1 nor the L2, but were possible grammars, given the inventory of options made available by UG, and yielded outputs that sounded more target-like. Further, as predicted by the PAPH, Iterativity, a parameter that has embeddings (see (2) in Chapter 4), proved to be very difficult to reset from its *Yes* to *No* value; only the most advanced subject, M.F., achieved this, though even this subject had some problems remaining with this parameter, as was evident from the few remaining forms with secondary stress. Finally, one of the possible strategies predicted in Chapter 4, using the weight-insensitive iamb, i.e. Strategy 4, was not borne out, which, I believe, can be attributed to a universal prohibition against weight-insensitive iambs. This issue is addressed in more detail in Section 6.3.3 below. Before that, we briefly consider below the grammars of the French-speaking subjects.

6.3.2 French-speaking learners

French-speaking learners, unlike the English, did very well in general with respect to final prominence. They were able to put more prominence on the final syllables of Turkish prosodic words 84.39% of the time (SD: 7.22). They also had no difficulties with Iterativity; the few cases of Iterativity (4.96%; SD: 0.82) arose mostly when they had non-final stress together with final prominence. Further, unlike the English-speaking subjects, no significant differences were found among the French; all French-speaking learners had the same grammar. No stage-like behaviour emerged. All of them, irrespective of their level of proficiency, or any other factor, had final prominence most of the time, and the few exceptions to final prominence did not pattern together, nor did they correlate with such factors as weight, again, unlike the exceptions of the English subjects (though see below since one learner, M.S., differed slightly from the others). So exceptions, in the case of the French, were most likely performance errors.

Since all French-speaking subjects behaved similarly, and followed the very same pattern, not all of them will be considered here separately. Only P.L., the French subject with the lowest level of proficiency in Turkish, is examined below. Before delving into P.L.'s grammar though, Table (15) below gives a summary of all of the relevant aspects of the French subjects' grammar, final prominence, final lengthening and iterativity, factors that could reveal any variation on the surface. As seen, P.L., the learner we will investigate here, does not differ significantly from the rest of the French subjects with respect to any of the dimensions considered, despite his lower level of proficiency in Turkish.

(15)

	Beginner	**Intermediate**			**Advanced**	
Parameter	**P.L.**	**J.P.**	**M.P.**	**M.S.**	**A.C.**	**S.C.**
Final prominence	83.63% (46/55)	93.22% (55/59)	80.35% (45/56)	73.68% (42/57)	91.53% (54/59)	83.93% (47/56)
Final lengthening	9.09% (5/55)	6.78% (4/59)	19.64% (11/56)	7.02% (4/57)	6.78% (4/59)	5.36% (3/56)
Iterativity	7.27% (4/55)	5.08% (3/59)	5.36% (3/56)	5.26% (3/57)	3.3% (2/59)	5.3% (3/56)

Note that the French-speaking subjects did not always lengthen final syllables of words in order to attain final stress/prominence; overall, only 9.11% (SD: 5.29) of their utterances had final lengthening, despite 84.39% having final prominence, meaning that final syllables did not need to be heavy in order to bear stress. This suggests, given the assumptions made in Chapters 2 and 3 about the acoustic correlates of foot structure, that the French-speaking subjects did not achieve final prominence via an iambic foot, but it was rather intonational prominence falling on the last syllable of a word (more on this in section 6.4). French-speaking subjects are different, in this regard, from all the English-speaking subjects examined above; when English-speaking learners stressed the final syllables of Turkish words, they also significantly lengthened those syllables, particularly when they were open (perhaps with the partial exception of the most advanced subject, M.F., at Stage 6, who, at times, did not lengthen final syllables).

P.L., the French subject to be considered here, had final prominence about 85% of the time, despite resorting to final lengthening only 9.09% of the time. Table (16) below provides examples of his outputs, together with percentages of words falling into the same pattern as the example provided. Notice that the L1 (French) column assumes French to be iambic here, as with most of the generative literature on French (see Chapter 3); as mentioned before, I assume, instead, that French is footless, following Jun & Fuegeron 2000 and many of the other phonetic accounts of French prominence (see e.g. Beckman 1988 and Ladd 1996 for a review). This argument will be considered in more detail in Section 6.4 below, where phonetic cues of prominence will be examined. Let us assume, for now, that French is iambic, as this will make comparison with the English-speaking subjects easier, and it is not crucial with respect to what is predicted for French-speaking learners in terms of final stress/prominence (it is mostly relevant for the cues to final prominence, which will be considered in the next section).

(16) P.L.'s grammar:

Condition	L1 (French)	Interlanguage	Percentage		Exceptions	Explanation
Bisyllabic words:						
a. LL	[(pará)]	[(pará)]	80%	4/5	kédi	initial stress
b. LH	[(çatál)]	[(çatál)]	100%	5/5	-	
c. HL	[(elmá)]	[(elmá)]	75%	3/4	áyna	One HL with initial stress; another turned into HH
d. HH	[(peynír)]	[(peyníʁ)] [(silgí:)]	83%	5/6	bárdàk	initial stress
Trisyllabic words:						
e. LLL	[a(rabá)]	[a(rabá)]	100%	3/3	-	One LLL turned into LLH
f. LLH	[(te(beşír)]	[te(beşír)] [bo(yací:)]	83%	5/6	dínozòr	initial stress
g. LHL	[ki(tapçí)]	[ki(tapçí)]	50%	2/4	yúmurta çiçékçi	nonfinal stress
h. LHH	[ka(lemlér)]	[ka(lemlér)]	80%	4/5	sarínsak	nonfinal stress
i. HLL	[hem(şire)]	[em(şiré)]	100%	2/2	-	Two HLLs turned into HLH
j. HLH	[mer(divén)]	[mer(divén)] [şar(kıcí:)]	71%	5/7	póʁtakàl şéftalì:	initial stress; iterativity
k. HHL	[don(durmá)]	[don(durmá)]	100%	4/4	-	
l. HHH	[def(terlér)]	[def(terlér)]	100%	4/4	-	

As seen, P.L. assigns final prominence most of the time, and he does so irrespective of the weight profiles of target words. In other words, not only final LH, but also final LL and even final HL sequences bear prominence on their last syllable. Given these facts, if the interlanguage grammar - or L1 French - was to be analyzed as having foot structure, these would have to be weight-insensitive iambs, which are, very likely, unattested (see e.g. McCarthy & Prince 1986, 1993, Hayes 1991, 1995, but cf. Altshuler 2009 who claims that Osage assigns weight-insensitive iambs). Based on this, and based on the acoustic cues to final prominence, I will argue that these learners' outputs do not, in fact, involve foot structure at all; rather, as with L1 Turkish, they involve intonational prominence falling on the last syllable of prosodic words. I will return to this issue later; for now, assuming that they involve foot structure, final HĹ and HH́ sequences would need to be analyzed as weight-insensitive iambs. P.L.'s grammar, then, would involve noniterative weight-insensitive iambs with right-to-left foot construction. As the grammar under this analysis is noniterative, End-Rule is not relevant; the only foot available is, at the same time, the head of the prosodic word, and the head of this foot, thus, bears primary stress.

Of course, P.L.'s outputs can also be analyzed as involving an unbounded foot, but this analysis would similarly have to treat the grammar as involving weight-insensitive iambs. To give an example, a word like *dondurmá*, with final stress, has to be treated as iambic, given that stress is word-final. This could either be captured with binary quantity-insensitive iambs, i.e. [don(durmá)], as we did in (16), or as involving an unbounded foot, i.e. [(dondurmá)]. Under either analysis, the grammar needs to be iambic and weight-insensitive, in order to capture final stress.

Finally, note that P.L.'s exceptional outputs that do not bear stress on their final syllable do not follow a clear pattern. First, exceptional, non-final, stress emerges both word-initially (e.g. *yúmurta*) and word-medially (e.g. *çiçékçi*). Second, it does not correlate with such factors as weight; it falls on a light syllable in a word like *yúmurta*, skipping a potentially heavy syllable, while falling on a heavy syllable in a word like *çiçékçi,* despite both words having exactly the same weight profile, LHL. In addition, the sonority profile of the coda consonant does not appear to play a role in leading to nonfinal stress; both sonorant (e.g. sarínsak) and obstruent non-final codas (e.g. *çiçékçi*) can bear exceptional non-final stress, as well as avoid it as in the usual case (e.g. dondurmá and kitapçí). That is, one cannot conclude that certain types of codas (e.g. sonorants) are moraic whereas others (e.g. obstruents) are not (see Zec 1988, 1995 for such an argument for e.g. Kwakwala and Lithuanian). This suggests that non-final stress, in the case of the French-speaking learners, is, at least to some extent, a performance error, and does not follow any clear pattern. However, when word-initial, the dominant form of non-final stress for these learners, including P.L., it could also be an effect of the variable PPh-initial accent available in French (see e.g. Jun & Fougeron 2000, see also Chapter 3) being transferred into L2 Turkish, given that these experimental words were located in PPh-initial position in Turkish (see Chapter 5).

With one exception, the rest of the French-speaking subjects behaved very similarly to P.L. P.L. did not differ from them despite his lower level of proficiency, and his outputs, including the exceptions, are representative of the patterns observed in the utterances of the other French-speaking subjects. However, for one subject, M.S., an intermediate-level Quebecois learner of Turkish, who had the lowest number of words with final prominence among all French-speaking subjects tested (at 73.68%, see (15)), there was a correlation with exceptional non-final prominence and the presence of a coda consonant. Non-final prominence, in the case of this subject, fell on a closed syllable in all cases but one. Conversely, not all syllables with codas bore non-final prominence. That is, syllables with codas only *variably* attracted prominence. Such a phenomenon has been documented for adult Québec French, too (Paradis & Deshaies 1990, Scullen 1997, Goad & Prévost 2011). This behavior does not necessarily imply weight-sensitivity (and thus the presence of foot structure) on the part of this learner. For example, it is not the case that she had weight-sensitive iambs, because closed syllables were only variably stressed, so they would still have to be in the dependent position of an iambic foot in cases where they did not attract prominence (the regular cases with final prominence).

All in all, with the partial exception of M.S., French-speaking learners' behavior can be summarized as (i) consistently having word-final prominence, (ii) doing so irrespective of the weight profiles of the stressed and penultimate syllables, and (iii) showing no significant differences based on level of proficiency, or any other factor, and thus demonstrating no stage-like behavior, unlike the English-speaking learners. In light of these observations, it appears that L1 (French) and L2 (Turkish) behave very similarly, and that transfer of L1 structures is sufficient for French-speaking learners of Turkish to attain a target-like grammar. This is despite the fact that the domain of prominence in French is the PPh, as opposed to Turkish, where it is the PWd; the relevant factor then, as predicted by the PAPH, is the presence/absence of foot structure, where Turkish and French behave similarly.

6.3.3 Discussion

First and foremost, the findings are quite consistent with the Prosodic Acquisition Path Hypothesis (PAPH) proposed in this thesis. In the most general terms, while the French-speaking subjects demonstrated native-like behaviour, with respect to word-level stress in Turkish, from the earliest stages of second language acquisition, and showed no stage-like behaviour, the English-speaking subjects went through a number of stages, consistent with the path proposed in this thesis (see Chapter 4), making changes towards restructuring their interlanguage grammar on the basis of the L2 input. Changes resulting from terminal parameters being reset (e.g. Extrametricality and Headedness) were employed first; changes that involve parameters with embeddings, such as Iterativity, were only made at later stages. As expected, no English-speaking learner was able to rid their grammar of the Foot, but one learner, M.F., the subject with the highest level of proficiency, had some outputs that were footless, presenting partial evidence against the strong form of the proposal that once projected, the Foot will never be expunged from the grammar. Perhaps, the Foot can also be lost, but only at near-native levels of proficiency. Further examination of this possibility will have to wait for future research on near-native speakers.

On the other hand, French-speaking learners, as their L1 prosodic structures are essentially the same as those of the L2 (with respect to the absence of foot structure), did not need to restructure their grammar; the initial state of their L2 grammar, with respect to lower-level prosody, is the same as their L1 end state grammar, and thus can account for the ambient input. As such, French-speaking learners of Turkish had no difficulty with producing footless Turkish utterances. Further, they were able to place word-level prominence on the final syllables of PWds, despite the fact that the domain of prominence in French is the PPh, as opposed to the PWd in Turkish. The crucial issue was, then, not the domain where prominence is assigned, but that the two languages do not have foot structure, as proposed in this thesis.

All terminal parameters whose being reset served to make the interlanguage grammar sound more native-like, were, in the end, reset by the English-speaking learners, with the exception of Weight-Sensitivity, which, though terminal, was not reset. We have seen, for example, all English-speaking learners, except for the two with the lowest level of proficiency, reset Extrametricality (from *Yes* to *No*). We have also seen several learners additionally reset Headedness (from *Left* to *Right*). Both are terminal parameters, and resetting both served to better account for the L2 input, thereby making their grammars sound more native-like. On the other hand, although resetting parameters with embeddings, such as Iterativity and Boundedness, would also have served to make their interlanguage grammar appear more-native like, these strategies were not employed by the vast majority of the English-speaking learners, consistent with the PAPH claim that these parameters should be very difficult to reset from their *Yes* to *No* settings (see (2) in Chapter 4). Only one English-speaking subject, M.F., the subject with the highest level of proficiency in Turkish, was able to reset Iterativity from *Yes* to *No*, and even in his case, the parameter had not completely been reset to its *No* setting; there were still many utterances that were compatible with the *Yes* setting of the parameter. That is, his grammar was most probably still undergoing transition with respect to the "correct" setting of this parameter.

On the face of it, the finding that Weight-Sensitivity was not reset, by the English-speaking learners, from its *Yes* to *No* setting, seems to be in conflict with the PAPH; after all, all terminal parameters should be easy to reset according to the PAPH, and there seems to be no reason, if one can reset two terminal parameters, as A.B. of Stage 3 did, why resetting a third one, Weight-Sensitivity, should be impossible, at least at a later stage in development than A.B. was at. In fact, that would make the grammar more symmetric on the surface, since all words would, then, end in a stressed syllable, no matter what weight the final syllable has, and the ambient input would better be accounted for by this analysis.

Thus, there seems to be no obvious reason why some advanced learners would not follow such a path.

One could claim that the reason why no such pattern was observed is simply due to chance, i.e. that it could have arisen if more learners had been tested.[10] I will not follow this line of thinking, however; I will, instead, take a different, stronger, position, and will argue that the PAPH interacts, as any theory of language acquisition should, with other factors in determining the level of difficulty for L2 learners, the other factor being language universals in this case.

The PAPH is as much a learning theory as it is a UG-based approach aiming to constrain our predictions of what L2 learners will and will not do. Its restrictive power comes both from the learning principles employed *and* the UG constrained principles and parameters assumed to hold of natural languages. It is the learning principles that predict terminal parameters to be easier to reset than parameters with embeddings, for example Iterativity. UG does not, otherwise, preclude a language from setting Iterativity to *No*. Noniterative footing is an option observed in many languages of the world (e.g. Southeastern Tepehuan,

---

[10] One could also argue, as alluded to in Chapter 4, that Weight-Sensitivity is not, in fact, a terminal parameter, but that it has more structure underneath it since, in all weight sensitive languages in which codas are weight-sensitive, long vowels are weight-sensitive, too, but not vice versa. That is, it could be argued that Weight-Sensitivity is, in fact, Weight-Sensitivity-to-Vowels (with the settings of *Yes* and *No*), under the *Yes* setting of which there is Weight-Sensitivity-to-Codas (again with *Yes* or *No* settings). This will capture the implicational relationship between being sensitive to the weight of long vowels vs. codas observed in world languages. For L2 acquisition, then, one could argue that Weight-Sensitivity is difficult to reset because it has embeddings underneath. But this would not explain why Weight-Sensitivity-to-Codas, which would, under this analysis, be a terminal parameter under the maximal parameter of Weight-Sensitivity-to-Vowels, cannot be reset from *Yes* to *No*, either. Clearly, putting more structure under Weight-Sensitivity is not the solution.

Kager 1997, 1999), but is rendered difficult according to the PAPH for learners coming from a language with a *Yes* setting.

On the other hand, once Headedness has been reset from *Trochaic* to *Iambic*, it is UG principles that rule out the option of resetting Weight-Sensitivity from *Yes* to *No*; otherwise, if the PAPH held true by itself, without being limited by language universals, all terminal parameters should be equally easy to reset from their *Yes* to *No* settings, as long as there is positive evidence triggering such a change. And in the case of Weight-Sensitivity, resetting it from *Yes* to *No*, for iambic learners such as A.B. of Stage 3, would, in fact, lead to higher levels of success with respect to final stress/prominence. That this was not done, neither by A.B. nor by any of the subjects at later stages (who instead lengthened final light syllables), despite being predicted by the PAPH and despite being a reasonable option from a cognitive point of view, is due to UG precluding such an option. That is, a strategy could be predicted to be easy on the PAPH, yet is not chosen since it is not permitted in the inventory of options allowed by UG. This is the inverse of the preceding scenario, that an option could be permitted by UG (Iterativity-*No*), but is too difficult to adopt given the learning principles integral to the PAPH.

There seems to be good evidence that there exist no iambic languages with no Weight-Sensitivity whatsoever, iambic languages where a heavy syllable is in foot-dependent position, i.e. (HĹ). Many researchers have argued that such languages do not exist (see e.g. Hayes 1985, 1987, 1995; McCarthy & Prince 1986, 1993, 1995, among others). Hayes (1985), in fact, goes further, and argues, in proposing the Iambic/Trochaic Law (based on Bolton 1894), that there are durational asymmetries between iambic and trochaic systems, and that iambs are typically uneven (e.g. reinforced by vowel lengthening), of the form [σ_μ . $\acute{\sigma}_{\mu\mu}$], while trochees are typically even [$\acute{\sigma}_\mu$. σ_μ] or [$\acute{\sigma}_{\mu\mu}$]. Though this certainly seems to be a tendency (and heads of iambs are lengthened, as was done by the Stage 4 and 5 learners), many iambic languages that are weight-sensitive but permit even parses, of the type of A.B. above (of Stage 3), have also been attested (e.g. Araucanian, Ojibwa, and Weri, among others, see Gordon 2002). What is unattested are, as mentioned, iambic parses such as [(H.Ĺ)] and [(H.H́)], parses where a heavy syllable is in foot-dependent position, though their trochaic counterparts, [(Ĺ.H)] and [(H́.H)], are attested, such as in Gooniyandi (see e.g. McGregor 1990, 1993; Kager 1992) and Modern Greek (Malikouti–Drachman & Drachman 1989, Drachman & Malikouti–Drachman 1999, Revithiadou 2004). In other words, weight-insensitive syllabic trochees are attested, whereas weight-insensitive syllabic iambs are not.

Prince (1991) nicely summarizes these facts by proposing a hierarchy of well-formedness for trochaic vs. iambic feet:

(17) a. Trochees: [$\acute{\sigma}_\mu$. σ_μ], [$\acute{\sigma}_{\mu\mu}$] >> [$\acute{\sigma}_{\mu\mu}$. σ_μ] >> [$\acute{\sigma}_\mu$]

b. Iambs: [σ_μ . $\acute{\sigma}_{\mu\mu}$] >> [σ_μ . $\acute{\sigma}_\mu$], [$\acute{\sigma}_{\mu\mu}$] >> [$\acute{\sigma}_\mu$]

That is, both the uneven trochee [$\acute{\sigma}_{\mu\mu}$. σ_μ] and the even iamb [σ_μ . $\acute{\sigma}_\mu$] are allowed, but they are lower on the scale than the even trochee [$\acute{\sigma}_\mu$. σ_μ] and the uneven iamb [σ_μ . $\acute{\sigma}_{\mu\mu}$]. What is not allowed, once again, is the weight-insensitive iamb of the type [$\sigma_{\mu\mu}$. $\acute{\sigma}_\mu$] or [$\sigma_{\mu\mu}$. $\acute{\sigma}_{\mu\mu}$], where a heavy syllable is in the dependent position of a foot.

If there is a universal foot inventory that excludes quantity-insensitive iambs, it is not surprising that no learner tested in our experiments followed such a path. This is despite the fact that doing so would be pedagogically reasonable. All final syllables would, after all, be stressed, and the ambient input would be better accounted for. Therefore, this finding seems to present strong evidence for the view that interlanguages are UG-constrained (see e.g. White 1989, 2003). Other research in the literature that has found similar results, where L2 learners followed a UG-constrained analysis, despite an alternative analysis being pedagogically reasonable, include Belikova 2008, *forthcoming* (for syntax) and Özçelik 2010, 2011 (for higher-level prosody, at the prosody-syntax interface).

Of course, one might wonder why these learners could not simply have produced codas that were not moraic, thereby producing target-like outputs without having to reset Weight-Sensitivity from *Yes* to *No*. This, I believe, is because they are building an optimal iambic grammar, one with uneven feet where possible. Further, since they are starting from a grammar with moraic codas, it would be surprising to switch to codas that are not moraic when this would lead to a non-optimal iambic grammar. At the very least, then, these results indicate that certain markedness considerations play a bigger role in L2 acquisition than the ambient input.

One might wonder, at this point, why no weight-insensitive trochees were, then, observed in the current study. If resetting Weight-Sensitivity, a terminal parameter, was not allowed in the grammars of the English-speaking subjects with an iambic grammar due to a linguistic universal prohibiting such an option, why is it that it was not done by the English-speaking subjects with a trochaic grammar, either? The answer to this question is rather simple. Though Weight-Sensitivity is a relatively easy parameter to reset, and its being reset is permitted - provided that the language is trochaic - by whatever linguistic universals are responsible for the foot inventory available to speakers, there was no reason for the learners with trochaic grammars to reset it, given the ambient input. In fact, Weight-Sensitivity being reset would result in a decreased success rate among these learners, which were discussed under Stage 1 above; final syllables would, then, never be stressed, even when they ended in an H.

The question remains, however, as to how learners would behave in moving from a weight-sensitive trochaic language like English to a weight-insensitive trochaic language like Gooniyandi or Greek. Given the PAPH, there should be no difficulties in making such a change in the grammar, since Weight-Sensitivity is a terminal parameter. However, the prediction remains to be tested.

All things considered, the results of the current study provide strong evidence for the PAPH, the proposal made in Chapter 4 of this thesis. This is particularly true when individual results are taken into consideration. Group results are informative only to the extent that (i) they reveal the general differences that exist between English- and French-speaking subjects, and (ii) they illustrate the range of variation, observed for final stress, among intermediate English-speaking learners, implying that different options are being considered at this level, some of which yield final stress more often than others. It is through the individual results that we obtain some insight into the grammars of each English-speaking subject, given that a certain output form with a certain stress pattern could be indicative of different parameter settings for different subjects. As was mentioned in Chapter 5, for example, it was predicted, and later found, that learners with trochaic and iambic grammars demonstrate the same behaviour on the surface for some conditions in the experiments. For example, LH and LHL words were both stressed on the H, with the former resulting in final and the latter non-final stress, by both trochaic and iambic English-speaking groups, since both groups had Weight-Sensitivity set to *Yes*. The differences between the grammars of the two groups of learners (i.e. trochaic vs. iambic) could have been obscured if each learner had not been analyzed separately and if only a few conditions had been included.

Finally, recall that the fact that no English-speaking subject was found to have reset Weight-Sensitivity to *No*, at the same time as having reset Headedness from *Trochaic* to *Iambic*, was linked, above, to the proposal that iambic languages that are weight-insensitive are not allowed by the universal foot inventory permitted by UG. This raises an important question for the French-speaking subjects. If this is true, why, then, did they have what looked like weight-insensitive iambs? Or why is it that L1 French, or L1 Turkish, seems to permit weight-insensitive iambs? The answer to this question takes us back to where we started in Chapters 2 and 3: Some languages are footless, and Turkish and French are among these. French-speaking learners of Turkish, then, were not producing weight-insensitive iambs, but, instead, footless utterances, as with L1 Turkish. It is no surprise then, if the L1 and L2 are the same with respect to not having foot structure, that French-speaking learners do not have any problems with producing footless outputs, whereas English-speaking learners, having foot structure in their L1, are not able to get rid of it in their L2.

The following section examines the acoustic cues used by English- vs. French-speaking subjects in achieving stress/prominence; a comparison of the English-speaking subjects with iambic systems and French-speaking subjects in general is particularly informative here: Whereas the former lengthen final syllables of PWds, this is not done by the latter, despite the fact that, on the surface, duration seems to be a more important cue for "prominence" in French than it is in English (see Chapter 3).

6.4 Acoustic cues of prominence: footed vs. footless outputs

One of the most important predictions made in this thesis was that whereas French-speaking learners will not have foot structure in their grammars of Turkish, English-speaking learners will; that is, English-speaking learners will not be able to get rid of the Foot that is available in their L1.

One of the assumptions behind this proposal was that for prominence to involve foot structure, intensity and/or duration must accompany it at the word level; pitch rise alone does not involve foot structure, nor does a flat structure, as in Turkish, where regular "stress" is either flat (involves no intensity, duration or pitch), or involves a slight pitch rise on the word-final syllable (see Chapter 2). This means that the best way to ascertain whether subjects have foot structure or not is by examining the phonetic cues of stress and determining whether these include intensity and/or duration.

English-speaking learners' stressed syllables should, then, be accompanied by higher intensity and/or greater duration, whereas this should not be the case for French-speaking learners. Further, if they act according to cross-linguistic tendencies argued for by Bolton (1894) and Hayes (1985), English-speaking subjects' trochees should be accompanied by greater intensity, and iambs by greater duration. A challenge in this regard is that French uses duration (in addition to pitch) for PPh-level prominence (see e.g. Jun & Fougeron 2000); the last syllable in a PPh (unless it involves a schwa) bears the PPh-level prominence in French, and is, thus, longer in duration than the other syllables within that PPh, though this prominence does not involve foot structure (see Chapter 3). One potential problem with this is that French-speaking learners might transfer this PPh-level cue to Turkish, and thus produce the last syllable of the experimental words with longer duration, thereby confounding the results.

In French, it is the final syllables of PPhs that are lengthened. The PPh-final syllable in French is also the final syllable of the PWd that heads the PPh. The Turkish words that were used in the experiments were not in PPh-final position (see Chapter 5), which was done partly to avoid this effect and partly to circumvent other confounding variables such as utterance-final lengthening (a universal tendency), as well as to ensure that the experimental word was in the strong position of the sentence (to avoid prominence reduction), which, in Turkish, is the leftmost PWd within the rightmost PPh of the I-Phrase (Özçelik 2010, Özçelik & Nagai 2010, 2011; see Chapter 2). Since the experimental words were not in PPh-final position in Turkish, no lengthening was expected, helping us disentangle the effects of PPh-level prominence from those of the presence/absence of foot structure.

If the French-speaking subjects transfer the L1 lengthening rule at the structural level - i.e. the last syllable of the *head* PWd of a PPh is lengthened – they still might lengthen the final syllables of the experimental words in Turkish;

even though these syllables are not in PPh-final position, they are final in the head PWd within the PPh. Although this may be a potential problem for less advanced learners, if French does not involve foot structure, French-speaking learners of Turkish should still lengthen (or intensify) less than English-speaking learners do, for blocking transfer of such a rule, unlike losing foot structure, should be learnable, since it does not involve expunging a prosodic constituent from the grammar.

In order to test these predictions, and in order to determine which acoustic cues learners are using in marking stressed/prominent syllables, a subset of the data, four of the five words in the LL condition, were further analyzed using TextGrids (see Section 6.1). The results are reported below for each of duration, intensity and pitch respectively. We start with duration, which is the most important cue to be discussed here, for it reveals significant differences between the English-speaking subjects with iambic systems and the French-speaking subjects in general; both groups attained final prominence, but with different cues.

6.4.1 Duration

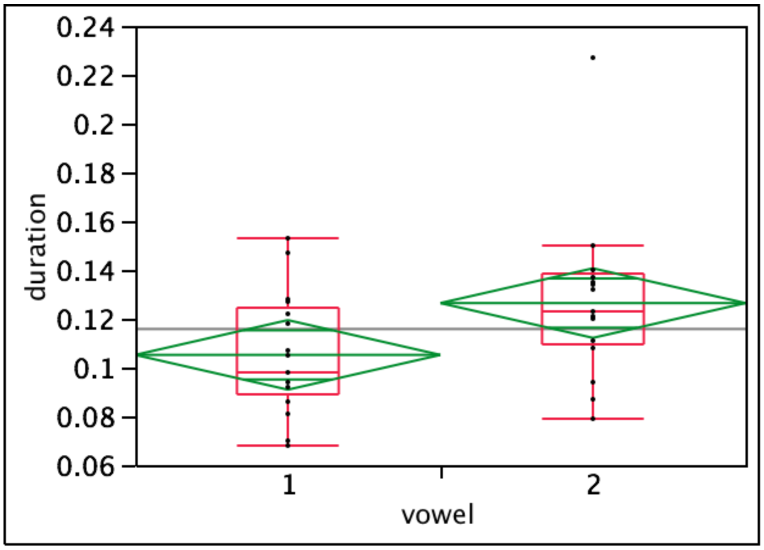
Table 6.3 below illustrates the durations (in seconds, s.) of the first and second vowels in the LL condition for the English- and French-speaking subjects, with separate results for the English-speaking subjects with iambic and trochaic grammars. We will focus in this section on a comparison of the English-speaking subjects with an iambic grammar and the French-speaking subjects, the two groups that had final stress/prominence in words in this condition.

Table 6.3: Duration measurements in the LL condition (in s.)

	First Vowel Duration (s.)	**Second Vowel duration (s.)**	**Difference (s.)**	**p-value**
L1 English:				
Iamb (n=5)	0.105176	0.126412	0.021236	p = 0.039
Troch (n=7)	0.107846	0.110269	0.002423	p = 0.7462
L1 French:				
All (n=6)	0.104087	0.107913	0.003826	p = 0.60

As seen, though the vowel of the second syllable was longer, for all of the subjects, than that of the first syllable, the difference in vowel length, between the first and the second syllable, was much greater for the English-speaking subjects with iambic grammars. The first vowel was, on average, 0.105 seconds (s) for these subjects, while the second vowel was about 0.126 s. That is, there was about 0.021 s. difference in duration between the first and the second vowel for these learners. This difference is statistically significant, ($F = (1, 32) = 4.60$, $p = 0.039$), as confirmed by the results of a one-way ANOVA. This is illustrated by the box plots in Figure 6.5 below. The horizontal line represents the first and second (final) vowels, indicated as 1 and 2 respectively, while the vertical line represents the duration of the corresponding vowel in s.:

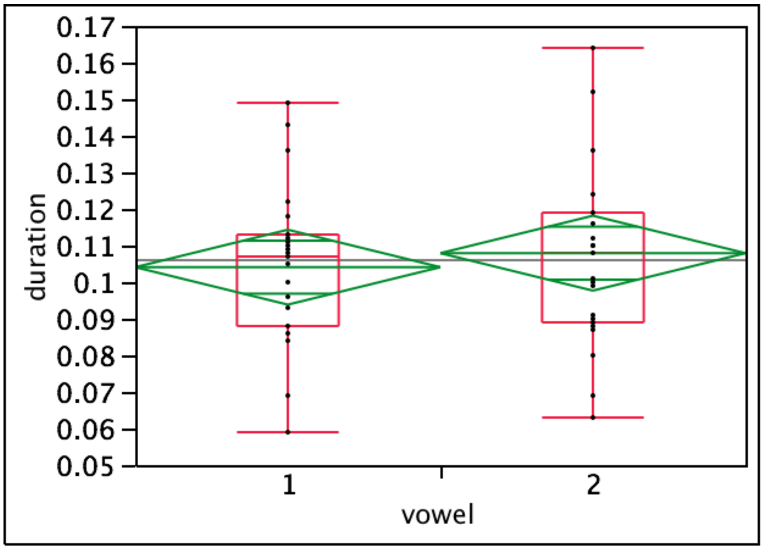
Figure 6.5: Durational differences between the first and second vowels for English-speaking subjects with iambic grammars



In short, the durational differences between the first and second vowels were not a chance factor for the English-speaking subjects with iambic systems; these subjects significantly lengthened the final vowels of words.

No such pattern was, however, found for the French-speaking subjects. In contrast to the English-speaking subjects with an iambic system, differences in the mean durations of first and second syllable vowels were much smaller for the French group; the first vowel was about 0.104 s. while the second vowel was about 0.108 s. for these learners. That is, the difference was, on average, only about 0.004 s., and this difference was not statistically significant, $F = (1, 44) = 0.28$, $p = 0.60$. This is illustrated by the box plots in Figure 6.6 below:

Figure 6.6: Durational differences between the first and second vowels for French-speaking subjects



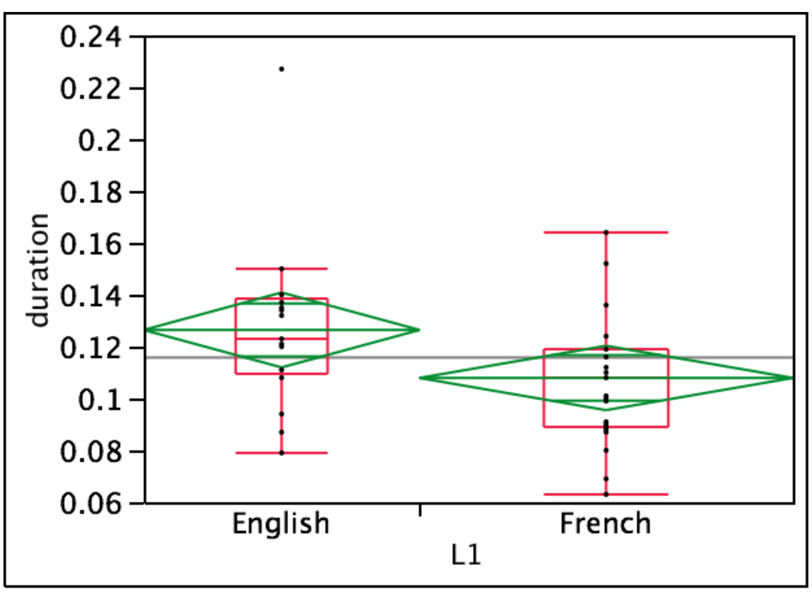
As for the English-speaking subjects with a trochaic system, they behaved, with respect to duration, more like the French-speaking subjects than like the rest of the English-speaking subjects.[11] The difference in mean durations between the first and the second vowel, for these learners, was only about 0.002 s., and this was not statistically significant, as the results of a one-way ANOVA indicated, $F = (1, 50) = 0.1059$, $p = 0.7462$.

[11] In calculating the vowel durations of the trochaic group, J.D., the only subject with a trochaic grammar who, at the same time, had word-final lengthening, was excluded, for representations of target LL forms, in the grammar of this learner, are different from both the trochaic and the iambic group in that the final syllable formed a foot by itself for this learner (see Section 6.3.1.3), whereas both syllables were in a bisyllabic foot for both the trochaic and iambic English groups. His results, though similar on the surface to the English-speaking subjects with an iambic grammar (in that the second syllable of a target LL was stressed, by means of turning LLs into LHs), are, thus, not informative as to whether heads of feet are longer than non-heads, and their inclusion would, therefore, confound the results. For these reasons, this learner's results will be reported separately throughout this section. J.D.'s final vowels were, on average, 0.159 s. while non-final vowels were 0.0953 s., $F = (1, 6) = 13.0911$, $p = 0.0111$.

To summarize thus far, the average durations of the first and second vowels in target LL words differed significantly for English-speaking learners who had an iambic grammar, whereas the means more or less coincided for the French-speaking subjects and for the English-speaking subjects with trochaic grammars.

Finally, a one-way ANOVA was conducted to compare the durations of word-final vowels uttered by the English-speaking subjects with an iambic system and the French-speaking subjects. The results are statistically significant at the 0.1 level, $F = (1, 38) = 3.87$, $p = 0.057$. The two scatterplots in Figure 6.7 below illustrate this; the means are rather different for the two groups. Whereas final vowels are usually longer than 120 milliseconds for the former group, they are, in general, lower than this mark for the latter.

Figure 6.7: Final syllable length in English-speaking learners with an iambic system and French-speaking learners:



As seen, the English-speaking subjects with an iambic system had much longer final vowels than the French-speaking subjects did. This is despite the fact that both groups achieved final prominence. This presents strong evidence for the proposal made earlier in this thesis; English-speaking learners attain Turkish final prominence through foot structure, whereas French-speaking learners can produce footless utterances. While English-speaking learners can change the foot headedness parameter, from Trochaic (Left) in their L1 to Iambic (Right) in the interlanguage, they cannot rid their grammar of foot structure. The result is a grammar which is neither like the L1 (trochee), nor the L2 (footless), neither in terms of structure (left- vs. right-headed), nor in terms of the cues (intensity in L1 English vs. duration in the interlanguage).

There is a well-known tendency in natural languages; duration is a better cue than intensity for iambic systems, whereas the converse is true for trochaic systems (Bolton 1894, Hayes 1995). It is very interesting, in this regard, how, in the grammars of the English-speaking subjects, the structural change (trochaic to iambic) was also accompanied with a change in cues, despite the fact that the dominant cue (duration) is *not* used by the L2, nor is it used to the same extent by the L1. These results suggest, once again, that interlanguages are natural grammars, constrained by the options made available by UG (White 1989, 2003).

Finally, the fact that final syllables were slightly longer, for the French speakers, too, than nonfinal syllables is because of reasons unrelated to the Foot; it is a well-known fact that, regardless of foot structure, there are more opportunities, for arbitrary lengthening, in word-final position than elsewhere in a word. This seems to be confirmed by the fact that even the English-speaking subjects with a trochaic system had slightly longer final syllables than initial, despite the fact that in trochaic systems the initial syllable is the most prominent one. Further, mean durations of final vowels for these two groups were not significantly different from each other, as the results of a one-way ANOVA confirm, $F = (1, 47) = 0.0886$, $p = 0.7673$.

In sum, the English-speaking subjects who stressed the final syllables of LL forms did indeed have iambs; stressed syllables in their productions were accompanied by significantly greater duration than unstressed syllables. This was not the case with the French-speaking subjects, however; their final syllables were only slightly longer than nonfinal syllables, with a ratio similar to the English-speaking subjects with trochaic grammars, who also had slightly longer final syllables than non-final. As opposed to the iambic English group, the durational differences between the two syllables for the French and trochaic English groups were statistically insignificant.

6.4.2 Intensity

In addition to duration, intensity measures were taken from the words in the LL condition. It was found that intensity was an important correlate only for the trochaic English-speaking group. Table 6.4 below presents a summary of the findings for all English- and French-speaking subjects, again with separate results for the English-speaking subjects with iambic and trochaic grammars. The first number in each row is maximum intensity (in dB) followed by mean intensity (in dB) in the following column.

Table 6.4: Intensity measures

	First σ Intensity (dB)		Second σ Intensity (dB)	
	Max	Mean	Max	Mean
L1 English:				
Iamb (n=5)	66.32	64.38	64.76	62.24
Troch (n=7)[12]	74.57	71.83	68.70	65.92
L1 French:				
All (n=6)	64.60	61.77	62.04	60.08

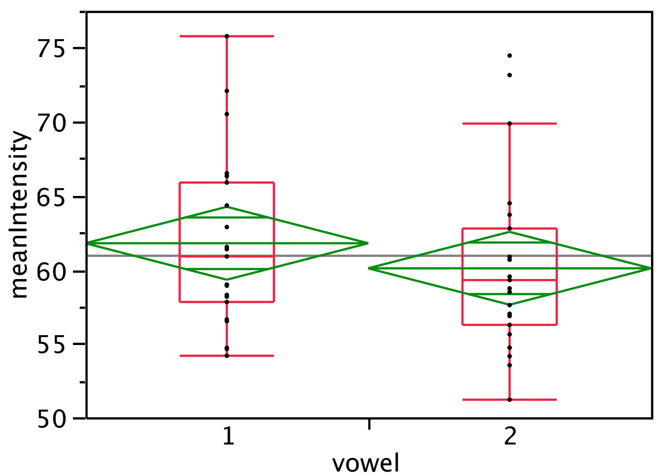
As with duration, intensity was not an important correlate of final prominence for the French-speaking subjects, as was predicted. Final syllables did not, for these learners, receive greater intensity than non-final syllables. As the last row of Table 6.4 indicates, in the LL condition at least, the intensity of the first vowel was, in fact, slightly higher, on average, than the second/final vowel. This is not statistically significant, as the results of a one-way ANOVA indicate; $F = (1, 44) = 2.1919$, $p = 0.1459$ for maximum intensity; $F = (1, 44) = 0.9491$, $p = 0.3328$ for mean intensity. Further, this was most probably caused by the fact that most of the words in the LL condition involved a lower vowel, in terms of height, in the first syllable, followed by a higher vowel in the second syllable (e.g. *kedi*, *gemi, ayı*), and that non-high vowels like /e/ intrinsically have greater intensity

[12] J.D., the learner who had a trochaic grammar with final lengthening, is excluded for the reasons mentioned above in note 11. The intensity values for this learner were as follows: Maximum intensity for the first syllable was 61.70 dB, whereas it was 60.97 dB for the second syllable. Mean intensity for the first syllable was 60.11 dB, and 57.74 dB for the second syllable. The differences are not statistically significant; $F = (1, 6) = 0.00384$, $p = 0.8511$ for maximum intensity; $F = (1, 6) = 0.1374$, $p = 0.7236$ for mean intensity.

than high vowels (Fonagy 1966).

The difference in intensity between the first and second syllables is illustrated, for these learners, by the box plots in Figure 6.8:

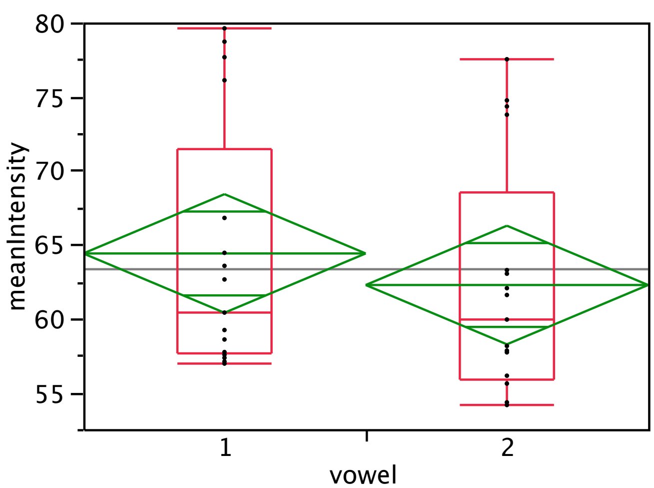
Figure 6.8: Mean intensity for French-speaking subjects:



It is not surprising for intensity to play no role for French-speaking learners; as was argued in Chapters 2, 3 and 4, neither intensity nor duration is expected to play an important role, for word-level prominence, in footless languages, and the L2 Turkish of French speakers, I argued, is footless, as are native French and Turkish.

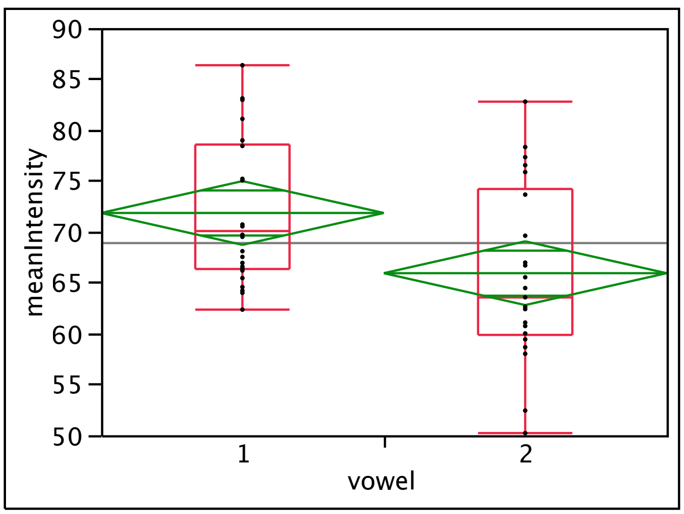
Intensity was not an important cue for the English-speaking learners with an iambic system, either. As was first noted by Bolton (1894) and argued for later by Hayes (e.g. Hayes, 1991; 1995, among others), iambic languages have elements contrasting in duration, not intensity, whereas trochaic languages tend to have elements contrasting in intensity but not duration. The results of the current research parallel this finding. While the English-speaking subjects with iambic grammars consistently lengthened the final syllables of Turkish PWds (see Section 6.4.1), they did not rely on intensity as a correlate of prominence. In fact, as is illustrated in Table 6.4 above, initial syllables were slightly higher, in intensity, for these subjects than final syllables, though, as with the French-speaking subjects, this was probably because of the vowel height asymmetries present in the experimental words, and as the results of a one-way ANOVA indicate, the difference was not statistically significant for these learners, either, F = (1, 32) = 0.3195, p = 0.5759 for maximum intensity; F = (1, 32) = 0.5874, p = 0.4491 for mean intensity. This is illustrated by the box plots below in Figure 6.9:

Figure 6.9: Mean intensity for English-speaking subjects with an iambic grammar:



Intensity was an important cue only for the English-speaking subjects with trochaic grammars. As Table 6.5 above illustrates, the first syllable of an LL word was, on average, 72.86 dB in maximum intensity, and 70.27 dB in mean intensity, for these learners, whereas the second syllable was 67.67 dB in maximum and 64.96 dB in mean intensity. These results, unlike the results from the French-speaking and the rest of the English-speaking subjects, are statistically significant, as the results of a one-way ANOVA indicate, F = (1, 50) = 7.2629, p = 0.0096 for maximum intensity; F = (1, 50) = 7.1977, p = 0.0099 for mean intensity. This is illustrated in Figure 6.10 below:

Figure 6.10: Mean intensity for English-speaking subjects with a trochaic grammar:



As a comparison of Figure 6.10 with Figures 6.8 and 6.9 show, the means clearly differ only for the English-speaking subjects who have a trochaic grammar, and not for the French-speaking subjects or English-speaking subjects with iambic grammars. This is not surprising since neither footless grammars, given our proposal in Chapter 2, nor iambic grammars, following e.g. Hayes

(1995), are expected to rely on intensity as a cue for prominence.

6.4.3 Pitch

As with duration and intensity, pitch measurements were taken for the LL condition, for both English- and French-speaking subjects. Pitch, unlike duration or intensity, was not a significant cue for prominence for any of the groups, although it approached significance in the case of the English-speaking learners with trochaic grammars. Table 6.5 below presents, for each group of learners, average maximum pitch, followed by average center pitch, for both the first and the second syllable. For all the groups, except for the French, both maximum pitch and center pitch were slightly higher on the first syllable than the second. For the French group, maximum pitch was higher on the first syllable, whereas center pitch was higher on the second.

Table 6.5: Pitch measurements

	First V Pitch (Hz)		**Second V Pitch (Hz)**	
	Max	Center	Max	Center
L1 English:				
Iamb (n=5)	160.65	151.92	152.71	149.15
Troch (n=7)[13]	159.04	150.06	140.27	131.83
L1 French:				
All (n=6)	188.94	171.17	178.15	175.08

[13] The pitch values for J.D., the subject who was excluded (see note 11), were as follows: Maximum pitch for the first syllable was 91.22 Hz, whereas it was 91.19 Hz for the second syllable. Mean pitch was 84.12 Hz for the first syllable, and 86.49 Hz for the second. The differences are not statistically significant; F = (1, 6) = 0.0009, p = 0.9775 for maximum pitch; F = (1, 6) = 0.2686, p = 0.6228 for center pitch.

A one-way ANOVA was conducted to test for statistical significance. For the French group, there was no significant effect for either maximum or center pitch; $F = (1, 44) = 0.4360$, $p = 0.5125$ for maximum pitch; $F = (1, 44) = 0.\ 0560$, $p = 0.8141$ for center pitch. For the iambic English group, too, the difference was far from significant: $F = (1, 32) = 0.0577$, $p = 0.8116$ for maximum pitch; $F = (1, 32) = 0.0294$, $p = 0.8649$ for center pitch. Only for the trochaic English group did the results approach significance, $F = (1, 50) = 2.1008$, $p = 0.1535$ for maximal, and $F = (1, 50) = 2.3094$, $p = 0.1349$ for center pitch.

All things considered, pitch is not a significant cue for any of the groups tested, although it seems to be of some importance for the trochaic English-speaking group. For the French and iambic English groups, it seems to play no role. These findings are surprising in that, as mentioned in Chapter 3, both L1 English and French rely on pitch to mark prominence much more than the interlanguage effects. On the other hand, Turkish only variably uses pitch in marking word-level prominence; many Turkish words have a plateau in terms of all acoustic correlates of stress, including pitch, and though the PAPH predicts losing both intensity and duration to be impossible, it says nothing about losing pitch. Losing pitch should, in fact, be easy, for this cue is not specifically tied to foot structure; only intensity and duration are. Positive evidence from the many Turkish words with flat structure might have led the learners to analyze Turkish as a language in which pitch does not play a significant role, despite the fact that pitch plays a much more important role in Turkish than intensity and duration do, lending further support to the current proposal that expunging intensity and duration from the grammar is impossible for learners from footed languages, even when positive evidence suggesting their absence is stronger.

6.4.4 Summary and discussion of cues

As the individual results discussed in Section 6.3 have suggested, there were three distinct groups of learners, with respect to which syllable they stressed in Turkish words in the LL condition: English-speaking learners with trochaic grammars who stressed the first syllable of a Turkish LL word; English-speaking learners with iambic grammars who stressed the second syllable of an LL word; and French-speaking learners, who, we argued, had footless representations. The results of acoustic measurements indicated that whereas intensity and, at least partially, pitch were correlates of stress in the productions of the English-speaking subjects with trochaic grammars, duration was the best correlate for the English-speaking subjects with iambic grammars. For the French-speaking subjects, on the other hand, none of intensity, duration, or pitch was a significant cue for final prominence.

The finding that neither intensity nor duration was an important cue for prominence in the interlanguage grammars of the French-speaking learners of Turkish was predicted, since these learners lack foot structure in their productions of Turkish words, and these two cues have been argued, in this thesis, to be associated with the presence of foot structure. More problematic is the fact that the French-speaking subjects did not rely on pitch, either, raising the question of what, then, was the cue for final prominence in the interlanguage grammars of the French-speaking subjects. Although it is beyond the scope of this thesis to find a definitive answer to this question, which has been resolved neither in the literature on L1 French (see Ladd 1996) nor L1 Turkish (see Özçelik 2009, to appear), I believe that it is related to the universal (or near-universal) status of a phonological constraint, NONFINALITY, "No head of PWd is final in PWd," and the way it interacts with perception (see Prince & Smolensky 1993/1994, Hung 1994, McCarthy 2003, among others, assigning a universal/near universal status to this constraint). Since NONFINALITY forces non-final stress in languages of the world, lack of any stress whatsoever might be perceived as final stress in languages like French and Turkish.[14]

This is reasonable, given how no previous phonetic research on Turkish or French has been able to find any reliable cues associated with final prominence. I would like to end this chapter with Ladd's (1996) observation on French "stress." Recognizing that final syllables in French are regarded, "by metrical phonologists," as the strongest, Ladd (1996) notes, "for many phoneticians, what is striking about these syllables is that they are so often acoustically indistinct." (p.56). In conclusion, it is high time for theoretical phonology to recognize the status of footless languages; presence/absence of the Foot, as argued in this thesis, seems to be parametric, and thus, the Foot is not a universal constituent of the Prosodic Hierarchy.

---

[14] Among the many other possibilities are the shape of the formant change, the quality of final vowels and the exact shape of the pitch contour (see Beckman 1988 and deJong 2000 for a comprehensive review of what factors, other than intensity, duration and pitch, could result in prominence in the world's languages).

Chapter 7: Conclusions

In most general terms, two new proposals were made in this thesis, one concerning phonological theory, the other second language acquisition. The formal theoretical argument is that the presence/absence of the Foot, which is commonly assumed to be a universal constituent of the Prosodic Hierarchy (see e.g. Selkirk 1995; Vogel 2009), is, in fact, parametric. That is, some languages, such as French and Turkish, are footless, as opposed to languages like English in which every prosodic word must contain at least one foot. The second argument, which concerns L2 acquisition, is the proposal of an acquisition path, which I have called the Prosodic Acquisition Path Hypothesis (PAPH) in this thesis. Some of the predictions arising from this proposal relate to the parametric status of the Foot, such as the impossibility of moving from a footed L1 to a footless L2. Others are based on a novel hierarchical tree representation of all foot-related parameters, and include, among other things, greater difficulties being predicted with resetting parameters that have embeddings (such as Iterativity) than parameters that are terminal in the tree (such as Foot-Shape and Extrametricality).

Below, I first summarize and discuss the formal proposal in Section 7.1, followed, in Section 7.2, by a summary and discussion of the acquisition-related proposal, the PAPH. Section 7.3, then, discusses implications of this research for the availability of Universal Grammar (UG) in second language acquisition, and, finally, Section 7.4 ends the dissertation by presenting some questions for future research.

7.1 Parametric status of the Foot

The assumption that the Foot is an essential constituent of the Prosodic Hierarchy was shared by much previous research in theoretical phonology. Findings that can be taken as evidence against the universal status of the Foot can be summarized as (i) phonetic evidence, (ii) phonological evidence, and (iii) evidence from L1 acquisition research.

First, phonetic evidence shows that there are some languages, such as Turkish and French, which do not contain acoustic evidence of foot structure. Phonetic research showed, for Turkish, that neither intensity nor duration correlates with regular word-final "stress" in this language: whereas exceptional stress is cued by both a sharp F0 rise and greater intensity, final prominence is, at best, marked only a slight (optional) rise in F0 (Levi 2005, Pycha 2006); for some speakers, there is no pitch rise but, instead, a plateau (Konrot 1981, 1987; Levi 2005). As for French, the domain of obligatory prominence is the Phonological Phrase (PPh), not the Prosodic Word (PWd); in a PPh consisting of several PWds, therefore, nonfinal PWds can surface without any kind of prominence (Goad & Buckley 2006, Goad & Prévost 2011, Jun & Fougeron 2000, Post 2003), meaning that at least for non-final PWds, one cannot assume stress or foot structure. And postulating foot structure only for the final PWd would violate Headedness (Selkirk 1996) (though see Goad & Prévost's 2011 alternative analysis that circumvents this problem). In addition, even the PPh-final prominence in French, which is cued by longer duration, higher pitch and lower intensity, is not produced in certain contexts, as Féry (2001) has experimentally demonstrated (see also Jun & Fougeron 2000). In view of these facts, some researchers have already argued that French has no stress, but instead demarcative cues to the edges of prosodic constituents (e.g. Beckman 1986, Ladd 1996).

Though the phonetic correlates of prominence in French and Turkish have not previously been taken explicitly as indicative of a lack of foot structure in these languages (despite many intonational analyses of French which make no recourse to the

Foot and implicate its absence), the Turkish facts, taken in the context of exceptional stress, provide, for the first time, *phonological* evidence, in addition to acoustic evidence, that the so-called regular final stress in this language is, in fact, (optional) intonational prominence falling on the last syllable of a PWd, and involves no foot structure. This is the argument that was made in Chapter 2 of this thesis; Chapter 2, in this regard, is, to my knowledge, the first attempt in the literature to provide formal evidence for lack of foot structure in a language. Further, a unified analysis of Turkish regular and exceptional stress was provided in that chapter, an analysis that, for the first time, captures both types of exceptional stress (pre-stressing and stressed), as well as regular (final) stress using a single grammar. The argument made was that Turkish is a trochaic language, but one which does not parse syllables into feet; there is, thus, no foot or stress present in regular Turkish words. Exceptionally stressed morphemes (both pre-stressing and stressed), on the other hand, come pre-specified, in the lexicon, with the edges of a foot; so the grammar can assign trochaicity and binarity, which are vacuously satisfied in words with regular stress, where there is no input foot, nor can one be created by the grammar.

If the Turkish grammar assigns no foot structure, this has consequences for interpreting the acoustic facts in other languages such as French, and more generally, most languages which have previously been analyzed as having Default-to-Opposite Edge stress assignment, or those analyzed as constructing Unbounded feet. The presence of exceptional stress in Turkish, and its rule-governed behavior is helpful in this regard, because the cues are completely different for the two types of "stress," and analyzing both as "stress", according to Gussenhoven (2004), would be misguided: though different languages can use different cues to varying degrees for marking stressed syllables, there should be no language where different cues are used in different words for marking stressed syllables, e.g. intensity for some words versus pitch rise for others.

The proposal that the presence/absence of the Foot is parametric is also supported by the findings of child language acquisition research. The first utterances of children learning footed languages do not contain any evidence of foot structure. Children first go through the Sub-minimal Word stage where their utterances are in the form of Core (CV) syllables (Demuth 1995, Fikkert 1994, Goad 1997, Ingram 1978, Jakobson 1941/68), the unmarked form of syllables, which, as Goad (to appear) convincingly argues, do appear to be footless. If the Foot comes as part of the Prosodic Hierarchy, and thus as part of UG, and if children receive positive evidence containing foot structure from the beginning of the acquisition process, it is a mystery why they do not start with the unmarked form of PWds, i.e. words composed of binary feet. If, however, the presence/absence of the Foot is parametric, children could, then, start with footless utterances, and construct the Foot based on positive evidence, that is, if the target language has foot structure, such as English. This would solve the problem posed by first language acquisition research, but would require the existence of footless languages, which, I have argued, do exist.

7.2 Prosodic Acquisition Path Hypothesis (PAPH)

If correct, this proposal also has certain predictions for second language acquisition, and might, for the first time, provide an explanation as to why L2 learners of footless languages, such as French and Turkish, have non-native accents even when they stress the final syllables of PWds/PPhs, syllables that are regarded, by metrical phonologists, to be the most prominent within their domains in these languages. Though, to my knowledge, there have been no previous studies on the issue, there is anecdotal evidence that even near-native speakers of languages like French and Turkish tend to overly stress final syllables in these languages.

The focus of previous research in L2 acquisition of stress has almost exclusively been on English (see e.g. Archibald 1993, Pater 1997, Tremblay 2006). The issue has been whether learners of English-type languages are able to stress the correct syllable or not, and crucially, *not* whether learners of French and Turkish can manage not to stress any syllables. In other words, the issue of whether learners can add/lose foot structure has not previously been considered, which is, of course, partially because the theory did not allow the parametric representation of the Foot proposed here. We now have a better understanding of these issues: We know, from the findings of previous research, that adding the Foot does not seem to be a problem, as French-speaking learners of L2 English can often stress non-final syllables in English words (see e.g. Pater 1997). Ridding the grammar of the Foot, on the other hand, *is* a problem, as the results of our experiments demonstrated for L2 Turkish.

I have presented a general, comprehensive account of the L2 acquisition of word-level prosody in this thesis, an account that considers not only the newly proposed parameter for the presence/absence of the Foot, but also most other parameters proposed in the literature that arise from having foot structure, in an effort to account for the L2 acquisition of stress in natural language. The result is the prediction of a "path," or, rather, several different acquisition paths, depending on the L1 and L2 involved.

In the most general terms, the PAPH can be summarized under three major points, some of which were tested in this thesis, with English- and French-speaking learners of Turkish; others require further research with different L1s and/or L2s: (i) Once a prosodic constituent, such as the Foot, is projected in an L1, it is impossible to expunge it from the grammar in learning a footless L2, whereas the inverse is not true; if the L1 is footless, learners of a footed L2 can add the Foot on the basis of positive evidence. (ii) It is impossible to deactivate a parameter altogether, but de facto deactivation, by means of resetting a parameter above the relevant parameter from *Yes* to *No*, is possible, though highly difficult. (iii) Some parameters are easier to reset than others, depending on whether they are terminal or not in the parameter tree proposed in Chapter 4, or depending on whether the change is from *No* to *Yes*, or *Yes* to *No*. To give an example, English-speaking learners of Turkish were predicted not to be able to rid their grammar of foot structure, even at advanced levels, and they were predicted not to be able to deactivate certain foot-related parameters that are irrelevant in L2 Turkish. They were, on the other hand, hypothesized to be able to reset the values of some of the parameters in their L1, on the basis of positive evidence, and consequently construct several different interlanguage grammars, grammars that are neither like the L1 nor the L2, but are possible grammars attested among the natural languages of the world.

In order to test these predictions, a production experiment was constructed, with various conditions, so as to determine the relevant aspects of learners' prosodic grammars (see Chapter 5). In particular, all possible Light- and Heavy-syllable combinations were generated in the bisyllabic and trisyllabic stimuli used in the experiment, amounting to in total 4 conditions of bisyllabic and 8 conditions of trisyllabic stimuli. It was shown to be crucial to have as many conditions as possible, as it is nearly impossible to determine the correct setting of a parameter through looking only at a few word shapes, as the same behavior on the surface can be caused by the interaction of several different parameters. This, to my knowledge, is the first experiment in the literature to consider words of all possible weight profiles.

The results of the experiments presented in Chapter 6 lend strong support to the PAPH. In particular, no L1 English-speaking learner of L2 Turkish was able to produce footless outputs (except partially for the most advanced learner who appeared to have some footless outputs); their productions all involved foot structure, unlike the French-speaking subjects, who were target-like in this regard, as their L1 is footless. English-speaking subjects did not, however, use the L1 settings of all parameters; they reset several parameters, in order to better accommodate the L2 input, and in doing so, they demonstrated stage-like behavior (see Chapter 6), along the lines predicted by the PAPH. Almost all English-speaking subjects, except for the two with the lowest level of proficiency, were, for example, able to reset Extrametricality, a terminal parameter, from *Yes* to *No*, thereby producing some words with final stress. Words ending in an H were, in particular, stressed on their final syllable by these learners, for Weight-Sensitivity, in their grammar, was still set to *Yes*, as in the L1. Several subjects were also able to reset Foot-Head from *Trochaic* to *Iambic*, in addition to resetting Extrametricality, and were, thus, able to stress a higher number of syllables in word-final position, though this did not result in 100% final stress, given that Weight-Sensitivity was still set to *Yes*, resulting in non-final stress in final HL sequences. At the next stage were learners who not only reset Extrametricality (from *Yes* to *No*) and Foot-Head (from *Trochaic* to *Iambic*) but also lengthened final open syllables, thereby rendering them heavy, and thus achieving final stress at all times. None of the learners with iambic grammars, though, reset Weight-Sensitivity from *Yes* to *No*, although this would also have resulted in all words being stressed on their final syllables, as with final lengthening, and with the additional benefit of not violating Faithfulness to underlying (target) vowel length. Finally, only one subject, the most advanced subject tested, was able to utter words without secondary stress, providing evidence that Iterativity, a non-terminal parameter, i.e. one with embeddings, is indeed a very difficult parameter to reset, as was predicted by the PAPH.

7.3 Evidence for UG

The findings of this thesis provide strong evidence for theories of second language acquisition that attribute a central role to UG (see e.g. White 1989a, 1989b, 2003, Schwartz & Sprouse 1994, 1996). Evidence for UG comes in three distinct forms: First, the interlanguage grammars used by the English-speaking learners of Turkish at each stage of the path (see Chapter 6) are possible grammars; although they are neither like the L1 nor the L2, they are grammars whose options are constrained by UG. Second, certain stages/interlanguage grammars, such as a truly weight-insensitive iambic system that allows for such feet as (HĹ) and (HH́), i.e. with heavy syllables in foot-dependent position, did not emerge in the productions of the English-speaking subjects, despite being pedagogically reasonable, as this is not permitted by the universal inventory of foot shapes (see e.g. Hayes 1995, McCarthy & Prince 1986). Third, the phonetic cues for stress, for the English-speaking subjects with both trochaic and iambic grammars, were consistent with universal tendencies in that trochaic grammars used intensity, whereas iambic systems used duration in cueing stressed syllables (see Hayes 1995). In this section, I briefly expand on these three types of evidence.

First of all, the interlanguage grammars used by the English-speaking learners of Turkish are all grammars that can be found in natural languages. Due to the inability to rid their grammars of foot structure, these learners were never fully target-like, even at advanced levels, in their productions of Turkish words. That they were not target-like does not, however, mean that they had no access to UG. Failure to lose the Foot was caused by transfer of L1 prosodic constituents. Despite not being able to produce footless outputs, these learners were still able to restructure their grammar, and go through a number of stages where they adopted different interlanguage grammars. What was special about each and every one of these grammars is that they are “possible” grammars, paralleling those found in many natural languages of the world. That learners were able to construct these grammars, which are neither like the L1 nor the L2, suggests that they could not have been built via transfer alone or L2 input alone (see Finer & Broselow 1986 for the same argument from syntax). If transfer were the only consideration, every learner would stop at Stage 0, and produce all Turkish words with English prosody. If L2 input alone were to drive changes in learners’ grammars, there would be no reason to have many intermediate stages where some words are stressed on their final syllables, but others are not. That is, even setting aside the issue of losing foot structure, that final syllables are more prominent in Turkish should, by itself, have led learners to stress the final syllables of all Turkish words, instead of causing them to restructure their grammar on a parameter-by-parameter basis, whose end result is only a proportional increase, each time, in the number of word-final syllables that are stressed. Crucially, the increase in the number of word-final stressed syllables is not an increase that reflects their being exposed to more input, nor is it one that is tied to frequency, but rather, one that reflects the changes made in the settings of parameters. If the patterns employed by L2 learners were not guided by the range of parameter settings made possible by UG, there would be no such correlation. All of this suggests that the hypothesis space for the options to be employed by second language learners is limited by UG (see e.g. White 1989, 2003), as opposed to the emergentist proposal that input alone is sufficient to drive changes in learners’ grammars (see e.g. Ellis 2003, O’Grady 2003).

In addition to the patterns that learners displayed, the patterns that they did not display are informative, too. None of the subjects, for example, reset Weight-Sensitivity, a terminal parameter, from *Yes* to *No*, although terminal parameters are expected to be easy to reset on the PAPH, and resetting this parameter would have served to make certain learners' outputs more target-like (and symmetric) on the surface. In particular, it would have led to 100% word-final stress in the case of subjects with iambic grammars. What these subjects did, instead, was to lengthen word-final vowels, thereby creating a heavy syllable at the end of every word, which, in turn, resulted in around 100% final stress, for under this grammar, though the language is still weight-sensitive, every PWd ends in a heavy syllable, which can then be stressed in a weight-sensitive system. Since these learners were able to reset other terminal parameters, such as Extrametricality and Foot-Type, this result is probably because weight-insensitive iambs (e.g. feet like (HĹ) and (HH́)) are ruled out by the inventory of options made available by UG (see e.g. Hayes 1985, 1987, 1995; McCarthy & Prince 1986, 1993, 1995, among others, who all concur that there are no such iambic languages). And if interlanguages are natural languages, we would expect the structures used by L2 learners to be constrained by UG, and not show properties that are not demonstrated by any other natural language.

One final fact that seems to favor a UG-constrained view of second language acquisition comes from the phonetic correlates of stress used by the English-speaking subjects. The correlates these subjects used in stressing Turkish syllables followed universal tendencies: Whereas learners with trochaic grammars used intensity, those with iambic grammars relied on duration (see Chapter 6). Note that neither the L2 input nor the L1 grammar could have led to reliance on duration, in the case of the English-speaking learners with iambic grammars, for L1 English, a trochaic language, uses intensity more than it uses duration, and L2 Turkish, being footless, uses neither intensity nor duration. This result can only be accounted for by reference to UG-constrained preferences that are innate to the language faculty; crosslinguistically, trochaic languages tend to rely on intensity whereas iambic languages use duration, leading some researchers, such as Bolton (1894) and Hayes (1995), to propose that there are durational asymmetries between the two types of languages. That is, when the English-speaking subjects changed from a trochaic into an iambic grammar, the phonetic cues they used also changed (from intensity to duration); these learners did not simply transfer the main phonetic correlate for stress which is used in the L1 (a trochaic language), and place it on the rightmost, rather than the leftmost, syllable within the foot (to make an iamb), but instead used duration, the main correlate of stress employed by iambic languages. As such, reliance on duration cannot, in any way, be accounted for by L1 transfer. And, as mentioned, this preference could not have been triggered by the L2 input, either, for the L2 of concern, Turkish, does not rely on duration at all in cueing prominent syllables. This knowledge, that iambic systems tend to use duration, rather than intensity, unlike trochaic systems, must, then, have come from UG.

All in all, there seems to be good evidence, arising from this research, for a UG-constrained view of second language acquisition. Both transfer from the L1 and access to UG seem to be relevant factors in determining the stages that learners go through in acquiring the prosody of a second language, and the L2 input alone is not sufficient in explaining the many grammatical structures that learners come up with (and many that they do not), though it is the L2 input that triggers grammar change and restructuring. In addition, by integrating learnability research with an investigation of the developmental paths that L2 learners go through, the thesis shows that learnability research can benefit from the observation of L2 developmental paths, and can, in turn, inform our understanding of such paths.

7.4 Questions for future research

Many predictions can be made based on the PAPH, some of which we were able to test in the L1 English/L2 Turkish setting, comparing these learners' performance with French-speaking learners of Turkish. Other predictions go beyond those tested in this thesis, and could better be tested with different L1/L2 pairs. Take, for example, the prediction that resetting terminal parameters is easier than resetting parameters with embeddings. Though we did find some evidence of this in our experiment (Iterativity was, after all, very difficult to reset, unlike Extrametricality or Foot-Type), it is not clear if *all* terminal parameters are easier to reset than their non-terminal counterparts. In this thesis, Weight-Sensitivity was not reset from its *Yes* to *No* setting, despite being a terminal parameter. We have linked this finding to two facts: (i) weight-insensitive iambs are not permitted by UG, so if interlanguages are natural languages, it is expected that the learners with iambic grammars will retain Weight-Sensitivity, and (ii) there was no reason for the learners with trochaic grammars to have a weight-insensitive system, since that accounts for the L2 input less well than the weight-sensitive trochees that are readily available from the L1. In order to further test the predictions based on the PAPH in this regard, it would be optimal to have an experimental setting with two trochaic languages, one with Weight-Sensitivity, another without, and see, among other things, if learners can reset this parameter from *Yes* to *No*. Further, such a study, if bidirectional, could help us see if moving from *No* to *Yes* is indeed easier, as predicted by the PAPH, than vice versa.

One can test, for example, English-speaking learners of Greek, which has weight-insensitive trochees (Malikouti–Drachman & Drachman 1989, Drachman & Malikouti–Drachman 1999, Revithiadou 2004), as well as Greek-speaking learners of English. Both languages are trochaic, while the two differ in that whereas English is weight-sensitive, Greek is not. It should be possible for English-speaking learners of Greek to reset Weight-Sensitivity from *Yes* to *No*, since weight-insensitive trochees, unlike weight-insensitive iambs, are not ruled out by the universal foot inventory allowed by UG. Further, such a change should be rather easy, according to the PAPH, since Weight-Sensitivity is a terminal parameter. Finally, such a bidirectional study would allow us to test another prediction of the PAPH, that moving from *Yes* to *No* is more difficult than moving from *No* to *Yes*. Though both groups of learners should be able to reset the relevant parameter, the task should be easier for Greek-speaking learners of L2 English, for they are going from *No* to *Yes*, whereas English-speaking learners of L2 Greek are moving from *Yes* to *No*.

One major argument made in this thesis was that it is much easier to build new structure than to undo structure present in the L1. This argument was supported: In learning Turkish regular stress/prominence (which is footless), English-speaking learners of Turkish were unable to undo foot structure, while French-speaking learners had an easier learning path since they had no structures to undo. What has not been tested in this thesis, however, is the situation where learners have to move from no feet to a system with feet, which is predicted to be easy, as it was proposed to be easier to build than expunge or revise structure. On the other hand, we know that learners from an L1 which has no structures of a certain type have a hard time acquiring a grammar that has such structures (see e.g. Goad & White 2004, 2006). Given these considerations, it would be interesting to test the acquisition of Turkish exceptional stress (which has foot structure) by English- and French-speaking learners. Given the PAPH, French-speaking learners should have fewer difficulties; they should be able to acquire Turkish exceptional stress relatively easily. Although English-speaking learners have experience with foot structure, and so may have an earlier advantage, they may also have certain long-standing problems, as resetting certain parameters, such as Iterativity to *No*, will be difficult. Therefore, it may be that whereas English-speaking learners will have an earlier advantage, French-speaking learners will do better at later stages.

Finally, it should be noted that there are certain shortcomings related to the relatively small sample size in this thesis. More subjects need to be tested in order to ascertain whether there are learners who would behave in ways consistent with an 'impossible' grammar, or show a path that is not predicted by the PAPH. This is a problem particularly at advanced levels; the claim that the Foot cannot be expunged by English-speaking learners of Turkish remains to be confirmed with additional learners at highly advanced levels. The most advanced English-speaking subject tested in this thesis did show some indications of ridding his grammar of the Foot, but this involved a very small subset of his utterances, and the results are, therefore, somewhat inconclusive. Clearly, more subjects need to be tested in the future at highly advanced levels.

★★★

In conclusion, the L2 acquisition data investigated in this thesis presents evidence for the Prosodic Acquisition Path Hypothesis that was proposed here, as well as for UG-based theories of second language acquisition in general. Further, the formal theoretical proposal that the presence/absence of the Foot is parametric contributes to our understanding of prosody in general and Turkish stress in particular, as well as resolving certain issues relating to our understanding of word-level prosody in both first and second language acquisition that were previously problematic.

REFERENCES:

Adam, Galit & Outi Bat-el (2008). The Trochaic Bias is universal: evidence from Hebrew. In *Proceedings of GALA 2007*. Cambridge, UK: Cambridge Scholars Publishing. 12-25.

Akita, Mamiko Orii (2006). Global foreign accent and classroom input in L2 perception and production. In D. Bamman, T. Magnitskaia & C. Zaller (eds.) *Proceedings of the 30th annual Boston University Conference on Language Development*. 1-14.

Akita, Mamiko Orii (2007). Global foreign accent and the effectiveness of a prosody-oriented approach in EFL classrooms. In H. Caunt-Nulton, S. Kulatilake & I. Woo (eds.) *Proceedings of the 31st annual Boston University Conference on Language Development*. 46-57.

Alcantara, Jonathan Brett (1998). *The architecture of the English lexicon*. PhD dissertation, Cornell University.

Alderete, John (1997). *Root-controlled accent in Cupeño*. Ms, University of Massachusetts, Amherst [ROA 253].

Alderete, John (2001). Root-controlled accent in Cupeño. *Natural Language and Linguistic Theory* 19. 455-502.

Allen, George & Sarah Hawkins (1978). The development of phonological rhythm. In A. Bell & J. B. Hooper (eds.) *Syllables and segments*. Amsterdam: North-Holland Publishing Company. 173-185.

Allen, George & Sarah Hawkins (1980). Phonological rhythm: definition and development. *Child Phonology* 1. 227-256.

Altshuler, Daniel (2009). Quantity insensitive iambs in Osage. *International Journal of American Linguistics* 75. 365-398.

Aksu-Koç, Ayhan & Dan Slobin (1985). The acquisition of Turkish. In D. Slobin (ed.) *The cross-linguistic study of language acquisition, Volume 1: the data*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Archibald, John (1992). Transfer of L1 parameter settings: some evidence from Polish metrics. *Canadian Journal of Linguistics* 37. 301–339.

Archibald, John (1993). *Language learnability and L2 phonology: the acquisition of metrical parameters*. Dordrecht, Netherlands: Kluwer Academic Publishers.

Archibald, John (1996). The acquisition of Yucatecan Maya prosody. In B. Bernhardt, J. Gilbert & D. Ingram (eds.) *UBC International Conference on Phonological Acquisition*. Somerville, MA: Cascadilla Press.

Archibald, John (1998). Second language phonology, phonetics, and typology. *Studies in Second Language Acquisition* 20. 190-211.

Archibald, John & Jana Carson (2000). Acquisition of Quebec French stress. In J. Jensen & G. van Herk (eds.) *Proceedings of the 2000 Annual Meeting of the Canadian Linguistics Association*. Ottawa: University of Ottawa.

Armstrong, Susan (1999). Stress and weight in Québec French. MA thesis, University of Calgary.

Avgustinova, Tania (1997). *Word order and clitics in Bulgarian*. Saarbrücken: University of the Saarland.

Baayen, R. Harald, Richard Piepenbrock & Leon Gulikers (1993). *The CELEX lexical database (CD-ROM).* Philadelphia, PA: Linguistic Data Consortium, University of Pennsylvania.

Baerman, Matthew (2004). Poststressing complementizers in Erkec (Kozicino). In *Revitalizing Bulgarian dialectology*. University of California Press / University of California International and Area Studies Digital Collection.

Barker, Chris (1989). Extrametricality, the cycle, and Turkish word stress. In J. Itô & J. Runner (eds.) *Phonology at Santa Cruz 1*. UC Santa Cruz: Syntax Research Center. 1-33.

Bat-El, Outi (1993). Parasitic metrification in the Modern Hebrew stress system. *The Linguistic Review* 10. 189-210.

Becker, Michael (2003). Hebrew stress: can't you hear those trochees? In E. Kaiser & S. Arunachalam (eds.) *Proceedings of PLC 26*. 45–58

Beckman, Mary E. (1986). *Stress and non-stress accent*. Dordrecht: Foris.

Belikova, Alyona (2008). Explicit instruction vs. linguistic competence in adult L2 acquisition. In H. Chan, E. Kapia & H. Jacob (eds.) *Proceedings of BUCLD 32*. Somerville, MA: Cascadilla Press. 48-59.

Belikova, Alyona (Forthcoming). *Getting L2 reciprocal and reflexive verbs right*. PhD dissertation, McGill University.

Berwick, Robert C. (1985). *The acquisition of syntactic knowledge.* Cambridge, MA: MIT Press.

Blevins, Juliette (1995). The syllable in phonological theory. In J. A. Goldsmith (ed.) *Phonological theory*. Oxford: Blackwell. 206-244.

Bloomfield, Leonard (1939). Menomini morphophonemics. *Travaux du Cercle Linguistique de Prague* 8. 105-115.

Bloomfield, Leonard (1957). *Eastern Ojibwa: a grammatical sketch, texts and word list*. Ann Arbor: University of Michigan Press.

Boersma, Paul & David Weenink (2011). Praat: doing phonetics by computer [Computer program]. Version 5.2.27, retrieved March 2011 from http://www.praat.org/

Bolton, Thaddeus (1894). Rhythm. *American Journal of Psychology* 6. 145-238.

Bonet, Eulàlia & Maria-Rosa Lloret (1998). *Fonologia catalana*. Barcelona, Ariel.

Broselow, Ellen (1988). Prosodic phonology and the acquisition of a second language. In S. Flynn & W. O'Neil (eds.) *Linguistic theory in second language acquisition*. Dordrecht, The Netherlands: Kluwer. 295-308.

Broselow, Ellen & Daniel Finer (1991). Parameter setting in second language phonology and syntax. *Second Language Research* 7. 35-60.

Broselow, Ellen & Hye-Bae Park (1995). Mora conservation in second language prosody. In J. Archibald (ed.) *Phonological acquisition and phonological theory*. Hillsdale, NJ: Erlbaum. 151-168.

Brulard, Inès & Philip Carr (2003). French-English bilingual acquisition of phonology: one production system or two? *International Journal of Bilingualism* 7, 2. 177-203.

Bullock, Barbara (1993). Does the French syllable have weight? In M. Mazzola (ed.) *Issues and theory in Romance linguistics: Selected Papers from the Linguistic Symposium on Romance Languages XXIII*, 3-18. Washington, DC: Georgetown University Press.

Charette, Monik (1991). *Conditions on phonological government.* Cambridge: Cambridge University Press.

Charette, Monik (2008). The vital role of the trochaic foot in explaining Turkish word endings. *Lingua* 118. 46-65.

Chomsky, Noam (1981). Principles and parameters in syntactic theory. In N. Hornstein & D. Lightfoot (eds.) *Explanation in linguistics.* London: Longman. 32-75.

Chomsky, Noam & Morris Halle (1968). *The sound pattern of English*. New York: Harper and Row.

Davis, Stuart (1988). Syllable onsets as a factor in stress rules. *Phonology* 5. 1-19.

deJong, Ken (2000). Attention modulation and the formal properties of stress systems. In A. Okrent & J. P. Boyle (eds.) *Proceedings of the 36th Meeting of the Chicago Linguistic Society (CLS 36).* Chicago: Chicago Linguistic Society. 71-92.

Delattre, Pierre (1966). A comparison of syllable length conditioning among languages. *International Review of Applied Linguistics in Language Teaching* 4. 183-198.

Dell, François (1984). L'accentuation dans les phrases en français. In F. Dell, D. Hirst & J.-R. Vergnaud (eds.) *Forme sonore du langage*. Paris: Hermann. 65-122.

Demuth, Katherine (1995). Markedness and development of prosodic structure. In J. Beckman (ed.) *Proceedings of the North Eastern Linguistic Society (NELS 25)*. Amherst, MA: GLSA, University of Massacchusetts. 13-25.

Di Cristo, Albert (1998). Intonation in French. In D. Hirst & A. Di Cristo (eds.) *Intonation systems.* Cambridge: Cambridge University Press. 203–227.

Dixon, Robert M.W. (1981). Wargamay. In R.M.W. Dixon & B.J. Blake (eds.) *The handbook of Australian language*s. 146-194.

Dobrovolsky, Michael (1999). The phonetics of Chuvash stress: implications for phonology. *Proceedings of the 14th International Conference of Phonetic Sciences*. 539-42.

Drachman, Gabriel & Angeliki Malikouti-Drachman (1999). Greek accentuation. In H. Van der Hulst (ed.) *Word prosodic systems in the languages of Europe*. Berlin & New York: Mouton de Gruyter. 897-945.

Dresher, B. Elan & Aditi Lahiri (2005). Main stress left in Early Middle English. In M. Fortescue, E. S. Jensen, J. E. Mogensen & L. Schøsler (eds.) *Historical Linguistics 2003: Selected Papers from the 16th International Conference on Historical Linguistics. Amsterdam Studies in the Theory and History of Linguistic Science.* Amsterdam: John Benjamins. 75–85.

Dresher, Elan. & Jonathan Kaye (1990). A computational learning model for metrical phonology. *Cognition* 34. 137-195.

Dupoux, Emmanuel, Christophe Pallier, Nuria Sabastian-Galles & Jacques Mehler (1997). A distressing "deafness" in French. *Journal of Memory and Language* 36. 406-421.

Dyck, Carrie, Julie Brittain & Marguerite MacKenzie (2006). Northern East Cree accent. In *Proceedings of the 2006 Annual Conference of the Canadian Linguistics Association.*

Eckman, Fred & Gregory Iverson (1993). Sonority and markedness among onset clusters in the interlanguage of ESL learners. *Second Language Research* 9. 234-252.

Ellis, Nick C. (2003). Constructions, chunking, and connectionism: the emergence of second language structure. In C. Doughty & M. Long (eds.) *The handbook of second language acquisition*. Oxford: Blackwell. 63-103.

Epstein, Samuel, Suzanne Flynn, Gita Martohardjono (1996). Second language acquisition: theoretical and experimental issues in contemporary research. Brain and Behavioral Sciences 19. 677-758.

Everett, Daniel (2003). Iambic feet in Paumari and the theory of foot structure. *Linguistic Discovery* 2. 22-44.

Féry, Caroline (2001). Focus and phrasing in French. In C. Féry & W. Sternefeld (eds.) *Audiatur vox sapientiae: a festschrift for Arnim von Stechow.* Berlin: Akademie-Verlag. 153-181.

Fikkert, Paula (1994). *On the acquisition of prosodic structure.* PhD dissertation, Leiden University/HIL. Published 1994, The Hague: Holland Academic Graphics.

Fikkert, Paula (1995). Models of acquisition: how to acquire stress. In J. Beckman (ed.) *Proceedings of the 25th North East Linguistics Society (NELS 25)*. Amherst: GLSA.

Finer, Daniel & Ellen Broselow (1986). Second language acquisition of reflexive-binding. In S. Berman, J-W. Choe & J. McDonough (eds.) *Proceedings of the 16th North East Linguistic Society (NELS 16)*. Amherst: GLSA.

Flynn, Suzanne (1996). A parameter-setting approach to second language acquisition. In W. Ritchie & T. Bhatia (eds.) *Handbook of language acquisition*. San Diego: Academic Press. 121-158.

Flynn, Suzanne & Gita Martohardjono (1994). Mapping from the initial state to the final state: the separation of universal principles and language-specific principles. In B. Lust, M. Suner, & J. Whitman (eds.) *Syntactic theory and first language acquisition: cross-linguistic perspectives*. Vol 1: *Heads, projections and learnability*. Hillsdale, NJ: Lawrence Erblaum. 319-335.

Fogle, Deena (2009). The acquisition of stress assignment by English speaking learners of French. *Evaluation paper*, McGill University.

Fónagy, Ivan (1966). Electrophysiological and acoustic correlates of stress and stress perception. *Journal of Speech and Hearing Research* 9. 231–244.

Fónagy, Ivan (1979). L'accent français: accent probabilitaire. In I. Fónagy & P. Léon (eds.) *L'accent en français contemporain.* Montréal / Paris / Brussels / Ottawa: Didier. 123-233.

Fónagy, Ivan (1980). L'accent français: accent probabilitaire. L'Accent en français contemporain. *Studia Phonetica* 15. 123-233.

Foster, Michael K. (1982). Alternating weak and strong syllables in Cayuga words. *International Journal of American Linguistics* 48. 59-72.

Fromkin, Victoria, Robert Rodman & Nina Hyams (2010). *An introduction to language* (9th ed.). Boston, MA: Thomson Wadsworth.

Fry, Dennis (1955). Duration and intensity as physical correlates of linguistic stress. *Journal of the Acoustical Society of America* 27. 765-768.

Garrett, Edward (1999). Minimal words aren't minimal feet. In M. Gordon (ed.) *UCLA Working Papers in Linguistics, no.1, Papers in Phonology 2*. 68-105.

Genesee, Fred (1989). Early bilingual development: One language or two?. *Journal of Child Language* 16. 161-179.

Genesee, Fred (2001). Bilingual first language acquisition: exploring the limits of the languagefaculty. In M. McGroarty (ed.) *21st Annual Review of Applied Linguistics*. Cambridge, UK: Cambridge University Press. 153-168.

Genesee, Fred & Elena Nicoladis (2006). Bilingual acquisition. In E. Hoff & M. Shatz (eds.) *Handbook of language development*. Oxford, England: Blackwell Publishing.

Genesee, Fred, Elena Nicoladis & Johanne Paradis (1995). Language differentiation in early bilingual development. *Journal of Child Language* 22. 611-631.

Gerken, LouAnn (1991). The metrical basis of children's subjectless sentences. *Journal of Memory and Language* 30. *431-451.*

Gerken, LouAnn (1994). A metrical template account of children's weak syllable omission from multisyllabic words. *Journal of Child Language* 21. 55-584.

Goad, Heather (1997). Codas, word minimality, and empty-headed syllables. *Child Language Research Forum* 28. Stanford: Center for the Study of Language and Information. 113-122.

Goad, Heather (2002). Markedness in right-edge syllabification: parallels across populations. *Canadian Journal of Linguistics* 47.151-186.

Goad, Heather (to appear). Phonological processes in child speech. In J. Lidz, W. Snyder & J. Pater (eds.) *The Oxford handbook of developmental linguistics.* Oxford: Oxford University Press.

Goad, Heather & Adèle-Elise Prévost (2008). Is there a foot in L1 French? The competing roles of markedness and ambient input. Paper presented at the Linguistic Symposium on Romance Languages (LSRL) 38, University of Illinois, Urbana-Champaign.

Goad, Heather & Adèle-Elise Prévost (2011). *A test case for markedness: The acquisition of Québec French stress*. Ms., McGill University.

Goad, Heather & Lydia White (2004). Ultimate attainment of L2 inflection: effects of L1 prosodic structure. In S. Foster-Cohen, M. Sharwood Smith, A. Sorace & M. Ota (eds.) *EUROSLA Yearbook 4*. Amsterdam: John Benjamins. 119-145.

Goad, Heather & Lydia White (2006). Ultimate attainment in interlanguage grammars: a prosodic approach. *Second Language Research* 22. 243-268.

Goad, Heather & Lydia White (2009). Articles in Turkish/English interlanguage revisited: implications of vowel harmony. In P. García-Mayo & R. Hawkins (eds.) *Second language acquisition of articles: Empirical findings and theoretical implications*. Amsterdam: John Benjamins. 201-232.

Goad, Heather & Meaghen Buckley (2006). Prosodic structure in child French: Evidence for the foot. *Catalan Journal of Linguistics* 5. 109–142.

Gordon, Matthew (2000). Re-examining default-to-opposite stress. In *Proceedings of the 26th Berkeley Linguistics Society (BLS 26)*. 101-112.

Gordon, Matthew (2002). A factorial typology of quantity-insensitive stress. *Natural Language & Linguistic Theory* 20. 491-552.

Grammont, Maurice (1933). *Traité de phonétique.* Paris: Librairie Delagrave.

Guilbault, Christian (2002). The acquisition of French rhythm by English second language learners. PhD thesis, University of Alberta.

Gussenhoven, Carlos (2004). *The phonology of tone and intonation*. Cambridge: Cambridge University Press.

Hale, Mark & Charles Reiss (2003). The subset principle in phonology: why the *tabula* can't be *rasa*. *Journal of Linguistics* 39. 219-244.

Halle, Morris & Jean-Roger Vergnaud (1987). *An essay on stress*. Cambridge, MA: MIT Press.

Halpern, Aaron (1995). On the placement and morphology of clitics. Stanford: Center for the Study of Language and Information.

Hammond, Michael (1985). Metrical structure in Lenakel and the Directionality-Dominance Hypothesis. *Minnesota Working Papers in Linguistics and Philosophy of Language* 10, 66-79.

Hammond, Michael (1986). The obligatory branching parameter in metrical theory. *Natural Language and Linguistic Theory* 4. 185-228.

Hancin-Bhatt, Barbara & Rakesh M. Bhatt (1997). Optimal L2 syllables. *Studies in Second Language Acquisition* 19. 331-378.

Harris, James W. (1991). The exponence of gender in Spanish. *Linguistic Inquiry* 22. 27-62.

Harris, James W. (1992). The form classes of Spanish substantives. In G. Booij & J. van Marle (eds.) *Yearbook of Morphology 1991.* Dordrecht: Kluwer. 65-88.

Hayes, Bruce (1981). *A metrical theory of stress rules*. PhD dissertation, MIT. [distributed by Indiana University Linguistics Club].

Hayes, Bruce (1982). Extrametricality and English stress. *Linguistic Inquiry* 13. 227-276.

Hayes, Bruce (1985). Iambic and trochaic rhythm in stress rules. In M. Niepokuj et al. (eds.) *Proceedings of the Eleventh Annual Meeting of the Berkeley Linguistics Society (BLS 11)*. 429-446.

Hayes, Bruce (1987). A revised parametric metrical theory. In J. McDonough & B. Plunket (eds.) *Proceedings of the 17th North East Linguistic Society*

(NELS 17). 274–89.

Hayes, Bruce (1995). *Metrical stress theory: principles and case studies*. Chicago & London: The University of Chicago Press.

Hochberg, Judith G. (1988). First steps in the acquisition of Spanish stress. *Journal of Child Language* 15. 273-292.

Holmes, Urban T. (1927). The phonology of an English-speaking child. *American Speech* 2. 219-225.

Hoskins, Steven (1994). Secondary stress and clash resolution in French: an empirical investigation. In M. Mazzola (ed.) *Issues and theory in Romance linguistics: Selected Papers from the 18th Linguistic Symposium on Romance Languages (LSRL 18)*. Washington, DC: Georgetown University Press. 35-47.

Hualde, José Ignacio, Gorka Elordieta, Iñaki Gamind & Rajka Smiljanic (2002). From pitch-accent to stress-accent in Basque. In C. Gussenhoven & N. Warner (eds.) *Laboratory Phonology* 7. Berlin: Mouton de Gruyter. 547–584.

Hulst, Harry van der (1999). Word accent. In H. van der Hulst (ed.) *Word prosodic systems in the languages of Europe*. Berlin & New York: Mouton de Gruyter. 3-115.

Hulst, Harry van der & Jeroen van de Weijer (1991). Topics in Turkish phonology. In H. Boeschoten & L. Verhoeven (eds.) *Turkish linguistics today*. Leiden: Brill. 11-59.

Hung, Henrietta (1994). *The rhythmic and prosodic organization of edge constituents*. PhD dissertation, Brandeis University.

Hyde, Brett (2001). *Metrical and prosodic structure in Optimality Theory*. PhD dissertation, Rutgers University.

Hyman, Larry (1977). On the nature of linguistic stress. In L. Hyman (ed.) *Studies in stress and accent*. University of Southern California. 37–82.

Hyman, Larry M. (2006). Word-prosodic typology. *Phonology* 23. 225-257.

Idsardi, William J. (1992). *The computation of stress*. PhD dissertation, MIT.

Ingram, David (1978). The role of the syllable in phonological development. In A. Bell & J.B. Hooper (eds.) *Syllables and segments.* Amsterdam: North-Holland. 143-155.

Inkelas, Sharon (1999). The exceptional stress-attracting suffixes in Turkish: representations versus the grammar. In R. Kager, H. van der Hulst & W. Zonneveld (eds.) *The prosody-morphology interface*. Cambridge: Cambridge University Press. 134-187.

Inkelas, Sharon & Cemil Orhan Orgun (1995). Level ordering and economy in the lexical phonology of Turkish. *Language* 71. 763-793.

Inkelas, Sharon & Cemil Orhan Orgun (1998). Level (non)ordering in recursive morphology: evidence from Turkish. In S. G. Lapointe, D. K. Brentari & P. M. Farrell (eds.) *Morphology and its relation to phonology and syntax*. Stanford: CSLI. 360-410.

Inkelas, Sharon & Cemil Orhan Orgun (2003). Turkish stress: a review. *Phonology* 20. 139-161.

Itô, Junko (1990). Prosodic minimality in Japanese. In M. Ziolkowski, M. Noske & K. Deaton (eds.) *Proceedings of the 26th Meeting of the Chicago Linguistic Society (CLS 26).* Chicago: Chicago Linguistic Society. 213-239.

Jakobson, Roman (1941/68). *Child language, aphasia, and phonological universals*. Mouton: The Hague.

Jun, Sun-Ah & Cécile Fougeron (2000). A phonological model of French intonation. In A. Botinis (ed.) *Intonation: analysis, modelling and technology.* Dordrecht: Kluwer. 209-242.

Kabak, Barış & Irene Vogel (2001). The phonological word and stress assignment in Turkish. *Phonology* 18. 315-360.

Kager, René (1989). *A metrical theory of stress and destressing in English and Dutch*. Dordrecht: Foris Publications.

Kager, René (1992). Are there any truly quantity-insensitive systems? In L. A. Buszard-Welcher, L. Lee, & W. Weigel (eds.) *Proceedings of the Eighteenth Annual Meeting of the Berkeley Linguistics Society*. Berkeley: University of California Press. 123–32.

Kager, René (1993a). The moraic iamb. In L. Dobrin, L. Nichols & R. Rodriguez (eds.) *Proceedings of the 27th Meeting of the Chicago Linguistic Society (CLS 27). Volume One: The General Session*. 291-305. Chicago: Chicago Linguistic Society.

Kager, René (1993b). Alternatives to the iambic-trochaic law. *Natural Language and Linguistic Theory* 11. 381-432.

Kager, René (1995). The metrical theory of word stress. In J. Goldsmith (ed.) *The handbook of phonological theory*. Cambridge, MA, and Oxford, UK: Blackwell.

Kager, René (1997). Rhythmic vowel deletion in Optimality Theory. In I. Roca (ed.) *Derivations and constraints in phonology*. Oxford: Oxford University Press. 463-499.

Kager, René (1999). *Optimality Theory*. Cambridge: Cambridge University Press.

Kager, René (2001). Rhythmic directionality by positional licensing. Paper presented at the 5th HIL Phonology Conference, University of Potsdam. Handout available as ROA-514 from the Rutgers Optimality Archive.

Kaisse, Ellen (1985). Some theoretical consequences of stress rules in Turkish. *Proceedings of the 21st Meeting of the Chicago Linguistic Society (CLS 21:1)*. 199-209.

Kaisse, Ellen (1986). Toward a lexical phonology of Turkish. In M. Brame, H. Contreras & F. Newmeyer (eds.) *A Festschrift for Sol Saporta*. Seattle: Noit Amrofer. 231–239.

Kappa, Ioanna (2000). On the phonological development of the early words: a case study. Paper Presented at the 14th International Symposium on Theoretical and Applied Linguistics. Thessaloniki: School of English, Aristotle University of Thessaloniki.

Kehoe, Margaret (1998). Support for metrical stress theory in stress acquisition. *Clinical Linguistics and Phonetics* 12(1). 1-23.

Kehoe, Margaret, Conxita Lleó & Martin Rakow (2004). Voice onset time in bilingual German-Spanish children. *Bilingualism: Language and Cognition* 7. 71-88.

Kiparsky, Paul (1991). *Catalexis*. Ms, Stanford University & Wissenschaftskolleg zu Berlin.

Klein, Harriet (1984). Learning to stress: a case study. *Journal of Child Language* 11. 375-390.

Konrot, Ahmet (1981). Physical correlates of linguistic stress in Turkish. *University of Sussex Language Centre Occasional Papers* 24. 26-52.

Konrot, Ahmet (1987). Stress in Turkish: is it determined phonologically or morphologically? In H. E. Boeschoten & L. T. Verheoven (eds.) *Studies on modern Turkish: Proceedings of the third conference on Turkish linguistics*. Tilburg University Press.

Krueger, John Richard (1961). *Chuvash manual: Uralic and Altaic series* 7. Bloomington: Indiana University Press.

Ladd, D. Robert (1996). *Intonational phonology*. Cambridge: Cambridge University Press.

Lees, Robert B. (1961). *The phonology of Modern Standard Turkish*. Bloomington: Indiana University Publications.

Léon, Pierre R. (1972). *Prononciation du français standard. Aide mémoire d'orthoépie à l'usage des étudiants étrangers.* Paris: Didier.

Levi, Susannah V. (2005). Acoustic correlates of lexical accent in Turkish. *Journal of the International Phonetic Association* 35:1. 73 -97.

Lewis, Geoffrey (1967). *Turkish grammar*. Oxford: Oxford University Press.

Lieberman, Philip (1960). Some acoustic correlates of word stress in American English. *Journal of the Acoustical Society of America* 32. 451-454.

Liberman, Mark (1975). *The intonational system of English*. PhD dissertation, MIT.

Liberman, Mark & Alan Prince (1977). On stress and linguistic rhythm. *Linguistic Inquiry* 8. 249–336.

Lleó, Conxita (2002). The role of markedness in the acquisition of complex prosodic structures in German-Spanish bilinguals. *The International Journal of Bilingualism* 6. 291-314.

Lleó, Conxita, Imme Kuchenbrandt, Margaret Kehoe & Cristina Trujillo (2003). Syllable final consonants in Spanish and German monolingual and bilingual acquisition. In N. Müller (ed.) *(In)vulnerable domains in multilingualism. Hamburg studies in multilingualism.* 191-220. Amsterdam/Philadelphia: John Benjamins.

Lleó, Conxita, Martin Rakow & Margaret Kehoe (2004). Acquisition of language-specific pitch accent by Spanish and German monolingual and bilingual children. In Timothy L. Face (ed.) *Laboratory approaches to Spanish phonology*. 3-27. Berlin/New York: Mouton de Gruyter.

Malikouti-Drachman, Angeliki & Gabriel Drachman (1989). Tonismos sta Ellinika [Stress in Greek.] *Studies in Greek linguistics 1989*. University of Thessaloniki. 127-143.

Malmberg, Bertil (1969). *Phonétique française*. Lund: Liber Läromedel.

Marcus, Mitchell Philip (1980). *A theory of syntactic recognition for natural language*. Cambridge, MA: MIT Press.

Martin, Philippe (1975). Analyse phonologique de la phrase française. *Linguistics* 146. 35–67.

Martin, Philippe (1980). Sur les principes d'une théorie syntaxique de l'intonation. In L. Rossi (ed.) *Problèmes de Prosodie*. Vol 1. (Studia Phonetica 17.) Paris: Didier. 91-101.

Martin, Philippe (1987). Prosodic and rhythmic structures in French. *Linguistics* 25. 925-949.

Mazzola, Michael (1992). Stress clash and segment deletion. In C. Laeufer & T. Morgan (eds.) *Theoretical analyses in Romance linguistics: Selected* *papers from the 19th Linguistic Symposium on Romance Languages (LSRL 19)*. Amsterdam: John Benjamins. 81-96.

Mazzola, Michael (1993). French rhythm and French segments. In W. Ashby, M. Mithun, G. Perissinotto & E. Raposo (eds.) *Linguistic perspectives on the Romance languages: Selected Papers from the 21st Linguistic Symposium on Romance Languages (LSRL 21)*. Amsterdam: John Benjamins. 113-126.

McCarthy, John (1979). *Formal problems in Semitic phonology and morphology*. PhD dissertation, MIT.

McCarthy, John (2003a). OT constraints are categorical. *Phonology* 20. 75-138.

McCarthy, John (2003b). Sympathy, Cumulativity, and the Duke-of-York Gambit. In C. Féry & R. van de Vijver (eds.) *The Syllable in Optimality Theory*. Cambridge, UK: Cambridge University Press. 23-76.

McCarthy, John & Alan Prince (1986). *Prosodic morphology*. Ms., Brandeis University and University of Massachusetts, Amherst.

McCarthy, John & Alan Prince (1993a). Generalized Alignment. In G. E. Booij, & J. van Marle (eds.) *Yearbook of Morphology*. . Dordrecht: Kluwer. 79–153.

McCarthy, John J. & Alan Prince (1993b). Prosodic Morphology: constraint interaction and satisfaction. Ms., University of Massachusetts, Amherst & Rutgers University. Available as ROA-482 from the Rutgers Optimality Archive.

McCarthy, John & Alan Prince (1995). Faithfulness and reduplicative identity. In J. Beckman, L. Dickey & S. Urbanczyk (eds.) *Papers in Optimality Theory. University of Massachusetts Occasional Papers* 18. 249–384.

McGregor, William (1990). *A functional grammar of Gooniyandi*. Amsterdam: John Benjamins.

McGregor, William (1993). Towards a systemic account of Gooniyandi segmental phonology. In P. Tench (ed.) *Studies in systemic phonology*. London and New York: Pinter. 19-43.

MacWhinney, Brian (1997). Second language acquisition and the Competition Model. In A. De Groot, J. Kroll (eds.) *Tutorials in bilingualism: psycholinguistic perspectives*. Lawrence Erlbaum, Mahwah, NJ. 113-142.

Meisel, Jürgen (1989). Early differentiation of languages in bilingual children. In K. Hyltenstam & L. K. Obler (eds.) *Bilingualism across the lifespan. Aspects of acquisition, maturity, and loss*. Cambridge: Cambridge University Press. 13-40.

Mellander, Evan (2003). (HL)-creating processes in a theory of foot structure. *The Linguistic Review* 20. 243-280.

Mertens, Pierre (1990). Intonation. In C. Blanche-Benveniste, M. Bilger, C. Rouget & K. van den Eynde (eds.) *Le Français parlé.* 159–176.

Mertens, Piet (1987). *L'intonation du français. De la description linguistique à la reconnaissance automatique.* PhD dissertation, Katholieke Universiteit Leuven.

Mester, Armin & Junko Itô (1989). Feature predictability and underspecification: palatal study in Japanese mimetics, *Language* 65. 258-293.

Montreuil, Jean-Pierre (1995). Coda weight and vowel length in Québec French. In J. Amastae, G. Goodall, M. Montalbetti & M. Phinney (eds.), *Contemporary research in Romance linguistics. Papers from the 22nd*

Linguistic Symposium on Romance Languages (LSRL 22). Amsterdam: John Benjamins. 25-36.

Montreuil, Jean-Pierre (2002). Vestigial feet in French. In *Proceedings of the 2002 Texas Linguistic Society Conference on Stress in Optimality Theory.* University of Texas Austin.

Montrul, Silvina (1997). *Transitivity alternations in second language acquisition: a crosslinguistic study of English, Spanish and Turkish*. PhD thesis, McGill University.

.Müller, Natascha (1998). Transfer in bilingual first language acquisition. *Bilingualism: Language and Cognition* 1. 151-171.

Müller, Natascha & Aafke Hulk (2001). Crosslinguistic influence in bilingual language acquisition: Italian and French as recipient languages. *Bilingualism: Language and Cognition* 4. 1-21.

Myers, Scoot & Benjamin B. Hansen (2007). The origin of vowel length neutralization in final position: Evidence from Finnish speakers. *Natural Language and Linguistic Theory* 25. 157-193.

Nakatani, Lloyd H. & Carletta H. Aston (1978). Perceiving stress patterns of words in sentences. *Journal of the Acoustic Society of America*. (supplement 1) 63, S55 (A).

Newell, Heather (2005). The Phonological Phrase. *McGill Working Papers in Linguistics* 19. 21-64.

O'Grady, William (2003). The radical middle: Nativism without Universal Grammar. In C. J. Doughty, M. Long (eds.) *The handbook of second language acquisition*. Oxford: Blackwell. 19-42.

Özçelik, Öner (2009). Exceptions in stress assignment: feet in input. Paper presented at the 40th Annual Meeting of the North East Linguistic Society (NELS 40) (to appear in *Proceedings of NELS 40*). MIT, Cambridge, MA.

Özçelik, Öner (2010). English/Turkish interlanguage prosody: implications for UG, Prosodic Transfer Hypothesis and Full Transfer/Full Access. In Y. Otsu (ed.) *Proceedings of the 10th Tokyo Conference on Psycholinguistics (TCP 2010)*. Tokyo, Japan: Hituzi Publishing Company. 221-237.

Özçelik, Öner (2011a). Redefining the Prosodic Hierarchy. Paper presented at Phonology in the 21st Century: In Honour of Glyne Piggott. McGill University, Montreal.

Özçelik, Öner (2011b). L2 acquisition of sentential stress: Implications for UG. In K. Dziubalska-Kołaczyk, et al. (eds.) *Achievements and perspectives in SLA of speech*. Frankfurt: Peter Lang. 217-229.

Özçelik, Öner (to appear). Exceptions in stress assignment: feet in input. In S. Kan, C. Moore-Cantwell & R. Staubs (eds.) *Proceedings of 40th Annual Meeting of the North East Linguistic Society (NELS 40*). Amherst, MA: GLSA.

Özçelik, Öner & Miho Nagai (2010). Possible syntactic subject positions in Turkish: evidence from phonology. In H. Maezawa & A. Yokogoshi (eds.) *Proceedings of the 6th Workshop on Altaic Formal Linguistics (WAFL 6)*. Cambridge, MA: MIT Working Papers in Linguistics (MITWPL).

Özçelik, Öner & Miho Nagai (2011). Multiple subject positions: a case of perfect match between syntax and prosody. In M. Byram & B. Tomaszewicz (eds.) *Proceedings of the 28th West Coast Conference for Formal Linguistics (WCCFL 28).* Somerville, MA: Cascadilla Press. 303-312.

Paradis, Claude & Denise Deshaies (1990). Rules of stress assignment in Québec French: evidence from perceptual data. *Language Variation and Change* 2: 135-154.

Paradis, Johanne & Fred Genesee. (1996). Syntactic acquisition in bilingual children: autonomous or interdependent? *Studies in Second Language Acquisition* 18, 1-25.

Paradis, Johanne, Sophie Petitclerc and Fred Genesee (1997). Word truncation in French-speaking two-year-olds. In E. Hughes, M. Hughes & Annabel Greenhill (eds.) *Proceedings of the 21st Annual Boston University Conference on Language Development*. Somerville, MA: Cascadilla Press.

Pater, Joe (1997). Metrical parameter missetting in second language acquisition. In S. J. Hannahs & M. Young-Scholten (eds.) *Focus on phonological acquisition*. Amsterdam: John Benjamins. 235-262.

Pater, Joe (2000). Nonuniformity in English stress: the role of ranked and lexically specific constraints. *Phonology* 17. 237-274.

Peperkamp, Sharon, & Emmanuel Dupoux (2002). A typological study of stress "deafness." In C. Gussenhoven & N. Warner (eds.) *Laboratory Phonology* 7. Berlin: Mouton de Gruyter. 203-240.

Peterson, Gordon & Ilse Lehiste (1960). Duration and syllable nuclei in English. *Journal of the Acoustic Society of America* 32. 693-703.

Pierrehumbert, Janet B. (1980). *The phonetics and phonology of English intonation*. PhD thesis, MIT.

Pierrehumber, Janet B. & Mary E. Beckman (1988). *Japanese tone structure*. Cambridge, MA: MIT Press.

Piggott, Glyne (1978). Algonquin and other Ojibwa dialects: a preliminary report. In W. Cowan (ed.) *The Ninth Algonquian Conference.* Ottawa, Carleton University.

Piggott, Glyne (1980). *Aspects of Odawa morphophonemics.* PhD dissertation, University of Toronto.

Piggott, Glyne (1983). Extrametricality and Ojibwa stress. *McGill Working Papers in Linguistics* 1. 80-117.

Piggott, Glyne (1995). Epenthesis and syllable weight. *Natural Language and Linguistic Theory* 13. 283-326.

Piggott, Glyne (1998). Foot form and the parsing of weightless syllables. *Proceedings of the 34th Meeting of Chicago Linguistic Society (CLS 34*). 315-332.

Pinker, Steven (1984). *Language learnability and language development*. Cambridge, MA: Harvard University Press.

Pinker, Steven (1994). *The language instinct*. New York: HarperCollins.

Post, Brechtje (2000). *Tonal and phrasal structures in French intonation*. The Hague: Holland Academic Graphics.

Post, Brechtje (2003). French phrasing and accentuation in different speaking styles. In E. Grabe & D. Wright (eds.) *Oxford University Working Papers in Linguistics, Philology and Phonetics* 8. 69-83.

Prieto, Pilar (2006). The relevance of metrical information in early prosodic word acquisition: a comparison of Spanish and Catalan. *Language and Speech* 49. 231- 259.

Prince, Alan. (1983). Relating to the grid. *Linguistic Inquiry* 14. 19-100.

Prince, Alan (1991). Quantitative consequences of rhythmic organization. In K. Deaton, M. Noske & M. Ziolkowski (eds.) *Proceedings of the 26th Meeting of Chicago Linguistic Society (CLS 26*). 355-398.

Prince, Alan & Paul Smolensky (1993). *Optimality Theory: constraint interaction in generative grammar.* Ms, Rutgers University & University of Colorado, Boulder. Published 2004, Malden, Mass. & Oxford: Blackwell.

Pycha, Anne (2006). A duration-based solution to the problem of stress realization in Turkish. *UC Berkeley Phonology Lab Annual Report*. 141-151.

Revithiadou, Anthi (2004). The Iambic/Trochaic Law revisited. In B. Arsenijevic, N. Elouazizi, M. Salzmann & M. de Vos (eds.) *Leiden Papers in Linguistics* 1.1. 37-62.

Revithiadou, Anthi, Hasan Kaili, Sophia Prokou & Maria-Anna Tiliopoulou (2006). Turkish accentuation revisited: a compositional approach to Turkish stress. In S. Yağcıoğlu, A. Cem Değer, Ö. Koşaner & A. Çeltek (eds.) *Advances in Turkish linguistics: proceedings of the 12th International Conference on Turkish Linguistics*. İzmir: Dokuz Eylül Yayınları. 37-50.

Revithiadou, Anthi. & Ruben van de Vijver (1997). Durational contrasts and the Iambic/Trochaic Law. In V. Samiian (ed.) *Proceedings of WECOL*. Department of Linguistics, California State University, Fresno, CA. 229-242.

Roca, Iggy (1988). Theoretical implications of Spanish word stress. *Linguistic Inquiry* 19. 393-423.

Roca, Iggy (1991). Stress and syllables in Spanish. In H. Campos and F. Martínez-Gil (eds.) *Current studies in Spanish linguistics*. Washington, DC: Georgetown UP. 599-635.

Rose, Yvan (2000). *Headedness and prosodic licensing in the L1 acquisition of phonology*. PhD dissertation, McGill University.

Rose, Yvan & Christine Champdoizeau (2007). Debunking the trochaic bias myth: evidence from phonological development. In *Proceedings of the 33rd Annual Meeting of the Berkeley Linguistics Society*. Berkeley: Berkeley Linguistics Society.

Rossi, Mario (1980). Le français, langue sans accent? In I. Fónagy & P. P. Léon (eds.) *L'accent en français contemporain*. (Studia Phonetica 15). Montréal: Didier. 13-51.

Scheer, Tobias (2011). Portrait of a phonological cripple: what schwa can(not) do to preceding vowels in French and elsewhere. Handout, the International Workshop on Metrics, Phonology and Acquisition. University Paris, June.

Schwartz, Bonnie (2003). Child L2 acquisition: paving the way. In B. Beachley, A. Brown & F. Conlin (eds.) *Proceedings of the 27th Annual Boston University Conference on Language Development*, Somerville, MA: Cascadilla Press. 26-50.

Schwartz, Bonnie & Rex Sprouse (1994). Word order and nominative case in nonnative language acquisition: a longitudinal study of (L1 Turkish) German interlanguage. In T. Hoekstra and B. D. Schwartz (eds.) *Language acquisition studies in generative grammar*. Amsterdam: John Benjamins. 317-368.

Schwartz, Bonnie & Rex Sprouse (1996). L2 cognitive states and the full transfer/full access model. *Second Language Research* 12. 40-72.

Scullen, Mary Ellen (1997). *French prosodic morphology: a unified account.* Bloomington: Indiana University Linguistics Club.

Selkirk, Elisabeth (1978). The French foot: on the status of the 'mute' *e*. *Studies in French Linguistics* 1. 141-150.

Selkirk, Elisabeth (1980). The role of prosodic categories in English word stress. *Linguistic Inquiry* 11. 563-605.

Selkirk, Elisabeth (1984). *Phonology and syntax: The relation between sound and structure.* Cambridge, MA: MIT Press.

Selkirk, Elisabeth (1995). Sentence prosody: intonation, stress and phrasing. In J. Goldsmith (ed.) *The handbook of phonological theory*. Cambridge, MA: Blackwell. 550-569.

Selkirk, Elisabeth (1996). The prosodic structure of function words. In J. Morgan & K. Demuth (eds.) *Signal to syntax: bootstrapping from speech to grammar*. Mahwah, NJ: Lawrence Erlbaum. 187-213.

Serra i López, Josep (1996). *La fonologia prosòdica del català*. PhD dissertation, Universitat de Girona.

Sezer, Engin (1983). On non-final stress in Turkish. *Journal of Turkish Studies* 5. 61–69.

Steele, Jeffrey (2002). *Representation and phonological licensing in the L2 acquisition of prosodic structure*. PhD dissertation, McGill University.

Steriade, Donca (1995). Underspecification and markedness. In J. Goldsmith (ed.) *A handbook of phonological theory*. Cambridge, MA: Blackwell. 114-174.

Swain, Erin (2008). *The acquisition of stress in Northern East Cree: a case study*. M.A. thesis. Memorial University of Newfoundland, St. John's, Newfoundland.

Thibault, Linda & Marise Ouellet (1996). Tonal distinctions between emphatic stress and pretonic lengthening in Quebec French. In the *International Conference on Spoken Language Processing 1996*, 638-641.

Tranel, Bernard (1987), *The sounds of French: an introduction*. Cambridge / New York: Cambridge University Press.

Tremblay, Annie (2007). *Bridging the gap between theoretical linguistics and psycholinguistics in L2 phonology: the acquisition and processing of word stress by French Canadian L2 learners of English.* PhD dissertation, University of Hawai'i.

Tzakosta, Marina (2004). *Multiple parallel grammars in the acquisition of stress in Greek L1*. PhD dissertation, ULCL/HIL. LOT Dissertation Series 93.

Underhill, Robert (1976). *Turkish grammar*. Cambridge, MA: MIT Press.

Unsworth, Sharon (2005). *Child L2, adult L2, child L1: Differences and similarities. A study on the acquisition of direct object scrambling in Dutch*. PhD dissertation, Utrecht University.

Vaissière, Jacqueline (1974). On French prosody. Quarterly Progress Report, Massachusetts Institute of Technology: Research Laboratory of Electronics. No 114. 212- 223.

Vaissière, Jacqueline (1983). Language-independent prosodic features. In A. Cutler & D. R. Ladd (eds.) *Prosody: models and measurements*. Berlin: Springer Verlag. 53–66.

van de Vijver, Ruben (1998). *The iambic issue: iambs as the result of constraint interaction*. PhD dissertation, HIL dissertation series 37. Holland Academic Graphics, The Hague.

Verluyten, S. Paul (1982). *Investigation on French prosodics and metrics.* PhD dissertation, Universiteit Antwerpen.

Verluyten, S. Paul (1988). La Phonologie du schwa français. *Lingvisticae Investigationes supplementa* 16. Amsterdam: John Benjamins.

Vihman, Marilyn May, Rory A. DePaolis, & Barbara Davis (1998). Is there a "trochaic bias" in early word learning? Evidence from infant production in English and French. *Child Development* 69. 935-949.

Voegelin, Charles (1935). *Tübatulabal grammar*. University of California Publications in American Archeology and Ethnology 34.2. Berkeley, CA: University of California Press.

Vogel, Irene (2009). Universals of prosodic structure. In S. Scalise, E. Magni, & A. Bisetto (eds.) *Universals of language today*. Dordrecht: Springer. 59-82.

Yip, Virginia & Stephen Matthews (2000). Syntactic transfer in a Cantonese–English bilingual child. *Bilingualism: Language and Cognition* 3. 193-208.

Walker, Douglas C. (1984). *The pronunciation of Canadian French.* Ottawa: University of Ottawa Press.

Walker, Rachel (1997). *Mongolian stress, licensing, and factorial typology*. Ms., University of California, Santa Cruz.

Wheeler, Deirdre (1979). A metrical analysis of stress and related processes in Southern Paiute and Tübatulabal. *University of Massacchusetts Occasional Papers in Linguistics 5*. 145-175.

Wheeler, Max W. (2004). Catalan stress is iambic. Paper presented at the 12th Manchester Phonology Meeting. May 20-22, 2004.

White, Lydia (1985). The pro-drop parameter in adult second language learning. *Language Learning* 35. 47-62.

White, Lydia (1987). Markedness and second language acquisition: the question of transfer. *Studies in Second Language Acquisition* 9: 261-289.

White, Lydia (1989a). Linguistic universals, markedness and learnability: comparing two different approaches. *Second Language Research* 5: 127

White, Lydia (1989b). *Universal grammar and second language acquisition*. Amsterdam: John Benjamins.

White, Lydia (1989c). The adjacency condition on case assignment: do L2 learners observe the Subset Principle? In S. Gass & J. Schachter (eds.) *Linguistic perspectives on second language acquisition*. Cambridge: Cambridge University Press.

White, Lydia (2003). *Second language acquisition and universal grammar*. Cambridge, UK: Cambridge University Press.

White, Lydia & Fred Genesee (1996). How native is near-native? The issue of ultimate attainment in adult second language acquisition. *Second Language Research* 12. 238-265.

Wijnen, Frank, Evelien Krikhaar, & Els den Os (1994). The (non)realization of unstressed elements in children's utterances: evidence for a rhythmic constraint. *Journal of Child Language* 21. *59-83.*

Wioland, François (1991). *Prononcer les mots du français: des sons et des rythmes.* Paris: Hachette.

Wood, Chris (2006). *The accentuation system of Northern East Cree*. Ms, Memorial University of Newfoundland.

Zec, Draga (1988). *Sonority constraints on prosodic structure*. PhD dissertation, Stanford University.

Zec, Draga (1995). Sonority constraints on syllable structure. *Phonology* 12. 85–129.

Appendix A: Turkish cloze test

1. The text:

(adapted from Montrul 1997)

Aşağıdaki yazıda, kelime eksik olan yerlerdeki boşlukları doldurunuz. Önce, yazının genel anlamını almak için her şeyi baştan sona okuyun. Sonra, her bir boşluk için, cevap kağıdından en uygun seçeneği işaretleyin.

Mehmet cuma akşamı işten döndü. Maaş dağıtım günü olmasına rağmen, __________(1) bile değildi. Oturup faturaları ödedikten, __________(2) parasını ayırdıktan, arabasının yakıt __________(3) hesapladıktan ve banka tasarruf hesabına __________(4) bir para koyduktan sonra, rahat __________(5) yaşam için geriye bir şey kalmayacağını __________(6) iyi biliyordu.

Sevdiği lokantaya gitmeyi __________(7), fakat keyfi yerinde değildi. Dairesinde __________(8) süre dolaştı ve bir sandviç __________(9). Kafası, kısa bir süre maddi __________(10) takıldı. Arabasını alıp, geziye çıkmaya __________(11) verdi. Belli bir istikameti olmamasına __________(12), ikamet ettiği yerden uzaklaşmayı arzu __________(13). Sakin bir köy yoluna saptı. __________(14) güzelliği moralini düzeltti. Arabayı kullanırken, __________(15) daldı ve kendisinin arsa sahibi __________(16), maddi durumunun düzeldiğini göz önüne __________(17). Mehmet bu hayali uzun __________(18) kurmaktaydı; fakat, hiçbir zaman __________(19) gerçekleştirmek için adım atmamıştı. Hayal kurmaya devam etti. Kafasında, kendi mahsulünü __________(20) olumlu ve olumsuz taraflarını tartışıyordu. __________(21) çatısındaki güneş enerji sistemi ile __________(22) evini hem de suyunu ısıtabileceğini tasavvur __________(23). Aynı zamanda, sebze dolu tarlaları __________(24), ve sebzeleri konserve edip, kışları __________(25) imkanını göz önüne getiriyordu. Mahsul __________(26) olduğu takdirde, fazlasını satıp, ek __________(27) ile tarım makineleri alabileceğini düşündü.

__________(28) Mehmet hayal dünyasından çıktı ve __________(29) sesle güldü. Acaba bu düşünceleri __________(30) gerçekleştirebilir miyim diye düşündü.

2. Answer Sheet

1. a) sevinçli
   b) üzgün
   c) ateşli
   d) hızlı

2. a) kültür
   b) kira
   c) yirmi
   d) duruş

3. a) sebebini
   b) masrafını
   c) duruşunu
   d) anlamını

4. a) neşeli
   b) şişman
   c) uzun
   d) az

5. a) iki
   b) çok
   c) bir
   d) az

6. a) az
   b) çok
   c) bir
   d) güzel

7. a) ağladı
   b) istedi
   c) anladı
   d) bildi

8. a) çok
   b) iyi
   c) biraz
   d) bir

9. a) aldı
   b) yaptı
   c) gördü
   d) haykırdı

10. a) paralara
    b) arabalara
    c) konulara
    d) dinozorlara

11. a) karar
    b) düşmanlık
    c) kızgınlık
    d) istek

12. a) göre
    b) bile
    c) halde
    d) rağmen

13. a) yaptı
    b) etti
    c) planladı
    d) düşündü

14. a) paranın
    b) uzayın
    c) fakirliğin
    d) manzaranın

15. a) düşüncelere
    b) denize
    c) kuma
    d) kızgınlığa

16. a) olduğunu
    b) olduğunda
    c) olunca
    d) olacakken

17. a) aldırdı
    b) yazdı
    c) getirdi
    d) not etti

18. a) iple
    b) zamandır
    c) hayatlı
    d) boylu

19. a) onu
    b) ona
    c) onda
    d) ondan

20. a) dövmenin
    b) görmenin
    c) bulmanın
    d) toplamanın

21. a) arabasının
    b) kafasının
    c) köyünün
    d) evinin

22. a) hem
    b) tüm
    c) biraz
    d) yarım

23. a) ediyordu
    b) yapıyordu
    c) çekiyordu
    d) biliyordu

24. a) olduğu
    b) davranması
    c) olması
    d) davrandığı

25. a) uyuması
    b) yemesi
    c) dinlendiği
    d) bitirdiği

26. a) az
    b) çok
    c) biraz
    d) birçok

27. a) sebze
    b) düşünce
    c) masraf
    d) gelir

28. a) sonra
    b) önce
    c) belki
    d) dün

29. a) çok
    b) sesli
    c) yüksek
    d) az

30. a) güzel
    c) sahtekar
    d) bilhassa
    d) gerçekten

3. Answer Key for the Cloze Test

1. a	**6.** b	**11.** a	**16.** a	**21.** d	**26.** b
2. b	**7.** b	**12.** d	**17.** c	**22.** a	**27.** d
3. b	**8.** d	**13.** b	**18.** b	**23.** a	**28.** a
4. d	**9.** b	**14.** d	**19.** a	**24.** c	**29.** c
5. c	**10.** c	**15.** a	**20.** d	**25.** b	**30.** d

Appendix B: Turkish read-aloud task

The text:
(based on a Turkish folk tale)

AY'I KUYUDAN ÇIKARMIŞ

Havanın güzel olduğu bir gece, Nasrettin Hoca, kuyudan su çekmeye karar vermiş. Elinde kovası, bahçedeki kuyunun başına gelmiş. Tam kovayı sarkıtacağı sırada, kuyunun içinde Ay'ı görmüş: "Eyvah!… Ay kuyuya düşmüş," diye üzülmüş. Sonra da, Ay'ı kuyudan nasıl çıkaracağını düşünmüş. Aklına kovası gelmiş. Ay'ı kova ile çıkarmaya karar vermiş.

Kovayı, ipiyle kuyuya sarkıtmış. Kova, suya değince de, çekmeye başlamış. Su ile ağırlaşan kova bir süre sonra, kuyunun duvarına takılmış. Nasrettin Hoca, kovayı ne kadar çekmek istemişse de bir türlü becerememiş.

Terlemiş. Kovanın yukarı gelmemesinin nedenini, Ay'ın ağır olmasına vermiş. Kovayı, yukarı çekmeyi sürdürmüş… Fakat ipe o kadar şiddetli asılmışki, ip kopmuş. Nasrettin Hoca da, sırt üstü yere yuvarlanmış.

Nasrettin Hoca, gözünü açınca, gökte parıldamakta olan Ay'ı görmüş, "Oh, çok şükür! Epeyce uğraştım, epeyce yoruldum, ama, sonunda Ay'ı kuyudan çıkarmayı başardım… Bu iş bütün yorgunluğuma değdi…" demiş.

Appendix C: English read-aloud task

The text:

(excerpt from an article in *Wall Street Journal*, March 15, 2011)

JAPANESE HEADWIND MAY HIT ASIA'S ECONOMIES

Wall Street Journal, March 15, 2011

Disruptions to Japan's economy in the aftermath of last week's earthquake and tsunami are expected to ripple across Asia in the coming weeks, further muddling the region's economic picture at a time when countries are already struggling with higher oil and food prices.

Asia overall is still expected to post vigorous growth this year, with estimates of gross domestic product of 7.5% to 8% excluding Japan. But economists were already predicting growth would slow from last year, when regional GDP surpassed 9% in a rebound from the global financial crisis, with central banks hiking interest rates and consumers starting to rein in spending to combat higher inflation.

Japan's disaster adds another set of uncertainties, at least in the short run. Friday's quake decimated vital infrastructure in parts of Japan and may leave many factories without reliable power supplies for weeks to come, jeopardizing supply chains for some of Asia's biggest exporters. Steel, paper and consumer-electronics plants were among those closed Monday.

Economists said the good news was that heavy spending on reconstruction projects would eventually help restore Japan's economy, which in turn could result in a surge of demand for some Asian products such as wood and other commodities. But any rebound isn't expected to come until the latter part of the year, with a sharp slowdown - or possibly even a contraction - expected in the next quarter or two.

Appendix D: Background questionnaire in English

(adapted from White, Belikova, Hagstrom, Kupisch, Özçelik 2009)

Subject Number:
Study: Tr 2011

McGill

Department of Linguistics

- I agree to participate in the study, which has been explained to me.
- I agree to allow the data to be used only for research purposes (including subsequent studies).
- I agree to be audiotaped.

Signature ____

Name (please print)____________________________________

Date ____

- Would you be willing to participate in other experiments? Yes/No (please circle)

All information on this questionnaire will remain confidential

A. Personal Information

- Last Name: ____________________ First Name: ____________________
- Telephone Number: ____________________
- E-Mail: ____
- Sex: Male / Female (please circle)
- Year of Birth: ____
- Place of Birth: City ________________ Country ____________________
- Occupation: ____
- Highest Level of Schooling: Secondary / College or Professional / University (please circle)

B. First Language

What is your first language? ____

What is the first language of: your mother? __________________ your father? ____________________

Which language(s) did you speak at home as a child? ______________________________________

C. Education & Language Use

(1) At what age did you begin to learn Turkish? _________________________

(2) Have you ever lived or are you living in any country where Turkish is the native language?

-- Yes/ No (please circle)

-- If yes, where: what country/countries? ___________________________________

-- If yes, for how long (approximate number of years) _________________________

(3) Are you currently taking a Turkish course?

-- Yes/ No (please circle)

-- If yes, where? ___________________________________

(4) Where did you learn Turkish? Please fill out:

		If yes, where (what country/countries)?	If yes, for how long (approximate number of years/months)?
Primary/Elementary School	Yes/No (please circle)		
High School	Yes/No (please circle)		
College	Yes/No (please circle)		
University	Yes/No (please circle)		
Other courses (e.g. evening classes)	Yes/No (please circle)		
Other situations: friends, spouse, home, vacation, etc.	Yes/No (please circle)		

(5) Where do you use Turkish? Please fill out:

		If yes, indicate approximately how many hours a week.
At home	Yes/No (please circle)	
At work	Yes/No (please circle)	
In social situations	Yes/No (please circle)	

D. Please rate your proficiency levels in Turkish (circle your responses)

READING:	beginner	intermediate	advanced	near native
WRITING:	beginner	intermediate	advanced	near native
SPEAKING:	beginner	intermediate	advanced	near native
LISTENING:	beginner	intermediate	advanced	near native
OVERALL COMPETENCE:	beginner	intermediate	advanced	near native

E. Other languages

Do you know any other languages besides your mother tongue and Turkish? Yes/ No (please circle)

If you answered *yes*, please list the language(s) and estimate your proficiency for each of the languages by circling one of the following: beginner, intermediate, advanced, near native.

______________________________ beginner intermediate advanced near native

______________________________ beginner intermediate advanced near native

______________________________ beginner intermediate advanced near native

______________________________ beginner intermediate advanced near native

______________________________ beginner intermediate advanced near native

______________________________ beginner intermediate advanced near native

Appendix E: Background questionnaire in French

(adapted from White, Belikova, Hagstrom, Kupisch, Özçelik 2009)

Subject Number:
Study: Tr 2011

McGill

Department of Linguistics

- Je consens à participer à cette étude, qui m'a été expliquée.
- Je consens à ce que les données soient utilisées pour fins de recherche (y compris des études subséquentes).
- Je consens à être enregistré(e) sur bande sonore.

Signature ______________________________

Nom (lettres majuscules s.v.p.) ______________________________

Date ______________________________

- Seriez-vous intéressé à participer à d'autres études? Oui/Non (encerclez votre réponse s.v.p.)

Toute information sur ce questionnaire demeurera confidentielle

A. Information personnelle

- Nom: ______________________ Prénom: ______________________
- Numéro de téléphone: ______________________
- Adresse courriel: ______________________
- Sexe: Homme / Femme (encerclez votre réponse s.v.p.)
- Année de naissance: ______________________
- Lieu de naissance: Ville ______________ Pays ______________
- Occupation: ______________________
- Niveau de scolarité: Secondaire / CÉGEP, collégial, ou formation professionnelle / Université (encerclez votre réponse s.v.p.)

B. Langue maternelle

Quelle est votre langue maternelle? ____

Quelle est la langue maternelle de: votre mère? ______________ votre père? ______________

Quelle(s) langue(s) avez-vous parlé à la maison pendant votre enfance?

____

C. Éducation et habitudes linguistiques

(1) À quel âge avez-vous commencé à apprendre le turc? ______________________________

(2) Avez-vous déjà vécu ou vivez-vous présentement dans un pays où le turc est une langue prédominante?

-- Oui/Non (encerclez votre réponse s.v.p.)

-- Si oui, dans quel(s) pays? ____

-- Si oui, pour combien de temps (durée approximative en mois/années) _______________

(3) Suivez-vous présentement un cours de langue turque?

-- Oui/Non (encerclez votre réponse s.v.p.)

-- Si oui, où? ___________________________

(4) Où avez-vous appris le turc? Remplissez le tableau suivant.

	Oui/Non (encerclez votre réponse s.v.p.)	Si oui, dans quel(s) pays?	Si oui, pour combien de temps (durée approximative en mois/années)
École primaire	Oui/Non		
École secondaire	Oui/Non		
Collège/CÉGEP	Oui/Non		
Université	Oui/Non		
Autres cours (ex. cours du soir)	Oui/Non		
Autres situations (ex. amis, conjoint(e), famille, voyage, etc.)	Oui/Non		

(5) Dans quelle situations utilisez-vous le turc? Remplissez le tableau suivant.

	Oui/Non (encerclez votre réponse s.v.p.)	Si oui, pour combien d'heures par semaine (approximativement)
À la maison	Oui/Non	
Au travail	Oui/Non	
Dans des situations sociales	Oui/Non	

D. Évaluez votre niveau de compétence en turc (encerclez vos réponses s.v.p.)

LECTURE:	débutant	intermédiaire	avancé	comparable à la langue maternelle
ÉCRITURE:	débutant	intermédiaire	avancé	comparable à la langue maternelle
LANGUE PARLÉE:	débutant	intermédiaire	avancé	comparable à la langue maternelle
ÉCOUTE:	débutant	intermédiaire	avancé	comparable à la langue maternelle
COMPÉTENCE GÉNÉRALE:	débutant	intermédiaire	avancé	comparable à la langue maternelle

E. Autres langues

Parlez-vous d'autres langues que votre langue maternelle et le turc? Oui/Non (encerclez votre réponse s.v.p.)

Si oui, énumérez s.v.p. les langues parlées ci-dessous et évaluez votre compétence pour chaque langue en encerclant une des quatre options suivantes: débutant, intermédiaire, avancé, ou comparable à la langue maternelle.

______________________ débutant intermédiaire avancé comparable à la langue maternelle

______________________ débutant intermédiaire avancé comparable à la langue maternelle

______________________ débutant intermédiaire avancé comparable à la langue maternelle

______________________ débutant intermédiaire avancé comparable à la langue maternelle

______________________ débutant intermédiaire avancé comparable à la langue maternelle

______________________ débutant intermédiaire avancé comparable à la langue maternelle

Appendix F: Stimuli

(overleaf for gloss)

1. LL:

kedi
para
gemi
ayı
sarı

2. LH

çatal
bıçak
köpek
kaşık
biber

3. HL

ayna
elma
atkı
silgi
pembe

4. HH

maymun
peynir
tavşan
bardak
armut

5. LLL

araba
boyacı
kayısı
hediye
sürücü

6. LLH

otobüs
dinozor
telefon
kelebek
tebeşir

7. LHL

karınca
yumurta
kitapçı
çiçekçi
birinci

8. HLL

şemsiye
hemşire
kanguru
şarkıcı
kırmızı

9. HHL

şempanze
ta:mirci
öğrenci
dondurma
şefta:li

10. HLH

portakal
eldiven
pantalon
merdiven
penguen

11. LHH

kalemler
sarımsak
örümcek
kitaplar
tekerlek

12. HHH

yıldızlar
öğretmen
defterler
bayraklar
doktorlar

13. Four-syllable

bilgisayar
motorsiklet
oyuncaklar
kura:biye
televizyon

14. Five-syllable

bilgisayarlar
itfaiyeci
kura:biyeler
televizyonlar
helikopterler

Stimuli: gloss

1. LL:

cat
money
ship
bear
yellow

2. LH

fork
knife
dog
spoon
pepper

3. HL

mirror
apple
scarf
eraser/duster
pink

4. HH

monkey
cheese
rabbit
glass/cup
pear

5. LLL

car
painter
apricot
gift
driver

6. LLH

bus
dinosaur
telephone
butterfly
chalk

7. LHL

ant
egg
bookseller
florist
first/firstcomer

8. HLL

umbrella
nurse
kangaroo
singer
red

9. HHL

chimpanzee
repairman
student
Ice-cream
peach

10. HLH

orange
(fruit)
glove(s)
pants
stairs
penguin

11. LHH

pens
garlic
spider
books
tyres

12. HHH

stars
techer
notebooks
flags
doctors

13. Four-syllable

computer
motorcycle
toys
cookie
television

14. Five-syllable

computers
fireman
cookies
televisions
helicopters