



**Yazd University**

**Faculty of Language & Literature**

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M.A. in Teaching English as a Foreign Language**

**Acquisition of English Onset and Coda Consonant Clusters by  
Persian Down Syndrome Learners: Optimality Account**

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## **Abstract**

Down syndrome (DS), one of the most prevalent conditions of moderate and severe mental retardation of genetic origin, has been the object of intensive studies for a number of years. Research and clinical experience demonstrate that some areas of language are generally more difficult for people with Down syndrome especially while picking up a second language. Persian syllable structure is "CV(CC)", composed of one consonant at the initial position and two optional consonants at the final position; whereas English syllable structure is "(CCC)V(CCCC)". Therefore, Persian EFL learners need to resolve the conflict between what they know (L1), and what they are learning (L2). This study accounts for the acquisition of the consonant clusters of English syllable structures both in onset and coda positions by Persian EFL learners with Down syndrome. Optimality theory (Prince & Smolensky, 1993) employs a notion of constraint dominance and a mechanism for selecting the optimal output with respect to a set of ranked constraints. Forty participants of the same level of English proficiency of the two groups of normal and affected by Down syndrome were included in this study. The data were collected via two tasks. The first task was a production task and the second was a perception task. The former task requires them to pronounce the 44 words and pseudo words on five categories of consonant clusters. In task two, participants were asked to repeat the same 44 words and pseudo words pronounced by the researcher with the correct pronunciation. Collected data were analyzed in the framework of Optimality Theory using SPSS software. The analyzed data revealed that all the learners had difficulties in producing initial consonant clusters in English and those coda clusters composed of more than two consonants. In addition, it turns out to be true that DS learners have more difficulty both in onset and coda clusters. Further, analyzed data revealed that CCC# and

CCCC# clusters are more difficult than CC# clusters. This study also revealed that epenthesis was more frequent in onset positions while deletion and substitution were more frequent in coda positions. Based on the findings of the study, there was a significant difference between all participants' production and perception.

**Key words:** Onset Consonant Cluster, Coda Consonant Cluster, Optimality Theory, Syllable Structure, Down syndrome

*To the Sole of my Sister*

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## Table of Contents

CHAPTER ONE: INTRODUCTION .....	1
1.1 Preliminaries .....	1
1.2 Statement of the Problem .....	3
1.3 Purpose of the Study .....	5
1.4 Research Questions .....	5
1.5 Significance of the Study .....	6
1.6 Theoretical Framework .....	7
1.7 Definition of the Key Terms .....	8
1.8 Outline of the Study .....	9
CHAPTER TWO: LITERATURE REVIEW .....	10
2.1 Second Language Phonology .....	11
2.2 Syllable structure.....	14
2.2.1 Sonority sequencing principle.....	15
2.2.2 Syllable structure across English and Persian.....	15
2.3 The class of consonant clusters .....	16
2.4 Conditions for morpheme structure .....	17
2.5 Consonant Cluster Parameters .....	18
2.5.1 English consonant clusters in different positions.....	18
2.5.2 English consonant clusters in initial position.....	18
2.5.3 English consonant clusters in final position.....	21
2.5.4 Persian consonant clusters.....	24
2.5.5 Errors involving consonant clusters .....	25
2.5.6 Previous studies on consonant clusters across English and Persian .....	26
2.6 Optimality theory .....	27
2.6.1 Definition of Optimality Theory .....	27
2.6.2 Basics of OT: Model of the grammar. ....	28
2.6.3 Nature of constraints. ....	30
2.6.4 Formalism of OT.....	32
2.6.5 Previous research on consonant cluster in the framework of OT. ....	34
2.7 Down syndrome .....	35
2.7.1 What is Down syndrome? .....	35

2.7.2 Etiology of Down syndrome .....	36
2.7.3 Language acquisition in children with Down syndrome.....	36
2.7.4 Bilingualism in children with Down syndrome .....	37
2.7.5 Previous research on consonant cluster in Down syndrome. ....	39
2.8 Impetus to the Present Study .....	40
CHAPTER THREE: METHODOLOGY.....	41
3.1 Participants .....	41
3.2 Materials.....	42
3.3 Procedure.....	42
3.4 Data Analysis .....	43
Chapter Four:Data Analysis .....	44
4.1 Overview of the Variables.....	44
4.2 Results of production Task.....	45
4.2.1 Onset CC clusters .....	45
4.2.2 Onset CCC clusters .....	46
4.2.3 Comparison of production of onset CC and CCC clusters.....	47
4.2.4 Coda CC clusters .....	49
4.2.5 Coda CCC clusters .....	50
4.2.6 Final CCCC clusters.....	51
4.2.7 Comparison of coda CC, CCC and CCCC clusters .....	52
4.3 Results of Perception Task.....	55
4.3.1 CC onset cluster .....	55
4.3.2 CCC onset cluster.....	56
4.3.3 Comparison of initial CC and CCC clusters. ....	57
4.3.4 Comparison of production and perception of consonant onset clusters.....	59
4.3.5 Coda two-consonant clusters.....	62
4.3.6 Final three-consonant clusters .....	63
4.3.7 Coda four-consonant clusters .....	64
4.3.8 Comparison of perception of coda CC, CCC and CCCC clusters .....	65
4.3.9 Comparison of participants' production of coda consonant clusters with their perception .....	67
4.4 Comparison of DS learners' Production with Their Perception .....	71
4.5 Comparison of the Participants' Production and Perception .....	72
4.6 Summary of the Results .....	74



CHAPTER FIVE: DISCUSSION AND CONCLUSION .....	77
5.2 Discussion of Research Questions .....	78
5.2.1 Acquisition of onset consonant clusters by Down syndrome learners.....	78
5.2.2 Acquisition of coda consonant clusters by Down syndrome learners.....	79
5.2.3 Comparison of Down syndrome Learners' production and Perception .....	81
5.2.4 Comparison of normal and DS learners' production and perception .....	81
5.2.5 How Optimality Theory (OT) works .....	83
5.2.6 Optimality Theoretic account of English consonant clusters in Persian.....	84
5.3 Concluding remarks .....	93
5.4 Implications of the Study .....	96
5.4.1 Theoretical implications.....	96
5.4.2 Pedagogical implications .....	97
5.5 Suggestions for Further Research .....	97
Appendices .....	99
Appendix I. Possible English consonant clusters.....	100
Appendix II. Possible Persian consonant clusters.....	101
Appendix III: Words on initial and final consonant clusters used in production and perception tasks.....	102

## List of Tables

Table 2.1 .....	36
Hypothetical Language 1: /ABCD/ → [ABC] .....	36
Table 4.1 .....	54
Descriptive Statistics of Production of #CC .....	54
Table 4.2 .....	55
Descriptive Statistics of Production of #CCC .....	55
Table 4.3 .....	56
Descriptive Statistics of Production of #CC and #CCC .....	56
Table 4.4 .....	56
Mixed between-within ANOVA for Production of #CC and #CCC .....	56
Table 4.5 .....	58
Descriptive Statistics for Production of CC# .....	58
Table 4.6 .....	59
Descriptive Statistics for Production of CCC# .....	59
Table 4.7 .....	60
Descriptive Statistics for Production of CCCC# .....	60
Table 4.8 .....	60
Descriptive Statistics of Production of CC#, CCC# and CCCC# .....	60
Table 4.9 .....	61
Mixed between-within ANOVA for Production of CC#, CCC# and CCCC# .....	61
Table 4.10 .....	63
Descriptive Statistics of the Participants' perception of #CC .....	63
Table 4.11 .....	64
Descriptive Statistics of the Participants' perception of #CCC .....	64
Table 4.12 .....	65
Descriptive Statistics of Comparison of Perception of Consonant Onset Clusters .....	65
Table 4.13 .....	66
Mixed between-within ANOVA for perception of #CC and #CCC .....	66
Table 4.14 .....	67
Descriptive Statistics of Comparison of Production and Perception of Consonant Onset Clusters .....	67
Table 4.15 .....	68
Mixed between-within ANOVA for #CC and #CCC .....	68
Table 4.16 .....	70
Descriptive Statistics of the Participants' perception of CC# .....	70
Table 4.17 .....	71
Descriptive Statistics of the Participants' Perception of CCC# .....	71
Table 4.18 .....	72
Descriptive Statistics of the Participants' Perception of CCCC# .....	72
Table 4.19 .....	72
Descriptive Statistics of Comparison of Coda Clusters .....	72
Table 4.20 .....	73
Mixed between-within ANOVA for CC, CCC and CCCC coda Clusters .....	73
Table 4.21 .....	75
Descriptive Statistics of Comparison of Production and Perception of Consonant Coda Clusters .....	75
Table 4.22 .....	76

Mixed between-within ANOVA for Coda CC, CCC and CCCC Clusters.....	76
Table 4.23.....	79
Results of Paired Samples T-test for DS Learners' Production and Perception of the Onset and Coda Consonant Clusters .....	79
Table 4.24.....	79
Results of a Paired-Samples T-test for DS Learners' total Production and Perception of the Initial and Final Consonant Clusters .....	79
Table 4.25.....	80
Descriptive Statistics of Comparison of Production and Perception of Consonant Clusters.....	80
Table 4.26.....	81
Mixed between-within ANOVA for Production and Perception of all consonant clusters in both groups.....	81
Table 5.1 .....	98
#CC clusters produced by Persian EFL learners.....	98
Table 5.2.....	100
#CCC clusters produced by Persian EFL learners.....	100
Table 5.3 .....	102
CC# clusters produced by native speakers of English and Persian EFL learners. ....	102
Table 5.4.....	103
CCC# clusters produced by Persian EFL learners.....	103
Table 5.5 .....	104
CCCC# clusters produced by Persian EFL learners .....	104

## Table of Figures

Figure 4.1 Comparison of the participants' production of #CC and #CCC .....	57
Figure 4.2 Comparison of the participants' production of CC#, CCC# and CCC# ...	62
Figure 4.3 Comparison of the participants' perception of #CC and #CCC .....	66
Figure 4.4 Comparison of the participants' production of consonant onset.....	69
clusters.....	69
Figure 4.5 Comparison of the participants' production with their perception.....	69
Figure 4.6 Comparison of the participants' perception of coda clusters .....	74
Figure 4.7 Comparison of the participants' production of coda clusters.....	77
Figure 4.8 Comparison of the participants' perception of coda clusters .....	77
Figure 4.9 Comparison of the participants' production and perception of consonant clusters.....	80
Figure 4.10 Comparison of the participants' production and perception of consonant clusters.....	82

# **Chapter One: Introduction**

## **1.1 Preliminaries**

Second language acquisition (SLA) is one of the most important fields in applied linguistics which has developed in the past 40-45 years. SLA can be defined as the process by which people learn one or more languages other than their mother tongue. Gass and Selinker (2008) gave many definitions for SLA. They put it as: "SLA is the acquisition of a language beyond the native language. It is the study of how learners create a new language system with only limited exposure to a second language" (p. 1).

According to Gass and Selinker (2008), SLA as a complex field attempts to understand the processes underlying the learning of second language. They believe that what is fundamental to understanding the nature of SLA is understanding what needs to be learned.

SLA may be affected by some genetic disorders such as Down Syndrome (DS). DS which is considered the main source of learning disabilities occurs when an individual has 47 chromosomes instead of the usual 46. DS occurs in approximately one in every 700 live births. Children with Down syndrome are usually smaller, and their physical and mental developments are slower compared to unaffected children (Down syndrome, n.d.).

One aspect of SLA which should be studied systematically is phonology. L2 phonology is different from other areas of L2 acquisition in that it deals with knowledge patterns and L2 learners' production and perception. The acquisition of second language phonology is a complex process. In order to understand how a learner learns a new phonological system, linguistic differences between the NL and the TL systems as well as universal facts of phonology should be taken into consideration (Gass and Selinker 2008).

Languages of the world "contain the two basic classes of speech sounds often referred to by the cover terms consonants and vowels." (Fromkin and Rodman 1988, p.47). A vowel is a sound which is uttered by no obstruction but utterance of consonants is followed by obstruction and friction (Falk, 1978; Fromkin and Rodman, 1988). Segmental phonological studies go beyond paradigmatic listing of sounds and also take into account syntagmatic relations between sounds i.e. consonantal cluster (Krzeszowski, 1990). According to Wardhaugh (1977), a consonant cluster occurs where two or more consonants happen to follow each other. In fact, sequences of consonants are determined by the phonological rules of a language; both word initially and finally (Wardhaugh, 1977; Fromkin and Rodman, 1979). English permits up to three consonants word initially such as /strɪt/ (street), /sprɪŋ/ (spring) etc., and four consonants are permitted in the final position like /tɛksts/ (texts). In Persian on the other hand, the restrictions are heavier with respect to the number of consonant clusters. In this language, consonant clusters occur only in final position and only two consonants are allowed in this position (Jabbari, 2006, p. 116). The clusters

such as /-ft/ as in *ræft* "he went" or /-rf/ as in *bærf* "snow" etc. are examples of this kind.

Optimality theory (OT) is an issue currently being debated in second language acquisition research. It began in phonology but has been extended to syntax and semantics more recently. Instead of rules, this theory deals with constraints and their rankings. There are two types of constraints: faithfulness constraints and markedness constraints. The former match the input with the output and the latter ensure the well-formedness of the output. The constraints conflict with each other, but these conflicts are resolved by a language-specific ordering of constraints (Gass and Selinker 2008, p. 183).

Many studies have been done in the framework of optimality theory, (Hancin-Bhatt and Bhatt, 1997; Broselow, Chen, and Wang, 1998; Lombardi, 2003). The present study is an attempt to investigate whether children with Down syndrome are able to acquire English onset and coda consonantal clusters. It also aims to compare typically developing learners of English and Down syndrome learners of this language regarding their production and perception of these consonant clusters in the framework of optimality theory.

## **1.2 Statement of the Problem**

Currently, there stands to be a vast amount of literature on the acquisition of consonant clusters both in normal and disordered First Language (L1) and Second Language (L2) acquisition. Research findings on L1 development in normal



children as well as those with phonological deficit has shown that children experience difficulty in producing consonant clusters (Yildiz, 2005).

Difficulty in production of consonant clusters is not peculiar to L1 acquisition. Similarly, the related studies show that L2 clusters also present something of a problem for both normal children and those affected by Down syndrome. This difficulty is due to the difference between the phonological rules of the mother tongue and the language being learned. For example, compared to a language like English which has a complex syllable structure, Persian has a simpler syllable structure. That is, Persian syllable structure is "CV (CC)", composed of one obligatory consonant at the initial position and two optional consonants at the final position; whereas English syllable structure is "(CCC) V (CCCC)". This entails that English phonotactics allow more than 20 options due to the optionality of consonant clusters. When facing such structural unfamiliarities, Persian EFL learners resort to their native language phonological rules leading into either deletion of some consonants or epenthesis of a vowel sound between two consonants in a consonant cluster. Therefore, one of the issues that, for some years, has engaged researchers in the area of second language acquisition is the acquisition of consonant clusters by L2 learners. As a work on L2 consonant clusters, Jabbari and Arghavan (2009) investigated the acquisition of English consonant clusters by Persian EFL learners in the framework of optimality theory. Although previous research on the language abilities in Down syndrome has answered some questions regarding the development of L2 consonant clusters in learners with Down syndrome, a basic account within a unified theoretical model is still lacking. To the best knowledge of

the researcher, such a study has not been conducted across English and Persian. So the acquisition of English consonant clusters by Persian Down syndrome learners is worth investigating in the present study. The current study particularly focuses on the acquisition of English onset and coda consonant clusters in Persian Down syndrome learners. Moreover, it tries to provide an account for the error types of the learners based on the optimality theory.

### **1.3 Purpose of the Study**

One of the problems that all Persian EFL learners whether normal or retarded ones may face is their difficulty in producing and comprehending English consonant clusters. The purpose of this study is to explore how Persian Down syndrome learners acquire English onset and coda consonant clusters.

This study also aimed at comparing Down syndrome learners and their typically developing counterparts regarding the perception and production of English consonant clusters.

Another goal was to investigate whether there was a significant difference between Down syndrome learners regarding their perception and production of English consonant clusters.

Additionally, whether optimality theory turns out to account for Persian speakers' language performance in relation to English consonant clusters was also considered as an important issue to be investigated.

## **1.4 Research Questions**

The following questions were addressed in this project, and the researcher tries to find answers for them based on the collected data.

1. How do Persian Down syndrome learners acquire English consonant clusters in the onset position?

2. How do Persian Down syndrome learners acquire English consonant clusters in the coda position?

3. Is there any significant difference between Persian Down syndrome learners' perception and production regarding the correct use of English syllable structure?

4. Is there any significant difference between Persian Down syndrome learners and their typically developing counterparts regarding the perception and production of English consonant clusters?

## **1.5 Significance of the Study**

Consonant clusters have been the subject of study in both normal and disordered phonological acquisition (Chin and Dinnsen, 1991) and are still subject to debate for the researchers in the field. Certainly, this issue will pose many problems for second language learning and teaching.

Compared to singletons, clusters present something of a problem in disordered acquisition (Chin and Dinnsen, 1991). The current study can

potentially predict the probable problems and difficulties of Persian EFL learners in learning such clusters.

This study will further provide language learners and teachers with some solutions to the learnability problems in acquiring English as a foreign language. It can help the experts in language learning and teaching to design curricula more appropriately suited to the needs of EFL learners and teachers regarding their learning and teaching characteristics the most important of which is L1 background.

## **1.6 Theoretical Framework**

The framework of the present study is based on Optimality Theory (OT) proposed by Prince and Smolensky(1993). Optimality theory is the most contemporary linguistic model proposing that the observed forms of language results from the interaction between conflicting constraints.

OT is a new view of generative phonology which is not derivational in nature. Assuming a different organization of the grammar, OT refers to mental and surface representations as input and output representations and uses constraints instead of rules as intermediate level of representation. These constraints are ranked in a particular order and determine which output is optimal or most harmonic with the grammar (Barlow & Gierut, 1999). There are two mediators between input and output representations in OT: GEN (generator) and EVAL (evaluator). GEN is responsible for generating an infinite number of output candidates and EVAL chooses the most optimal output by considering a set of universal constraints (CON).