Rule Inversion in Persian:
The Change of /e/ to [a] in The Standard and Esfahani Accents

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Abstract
1- Introduction
Standard Persian is the major accent spoken in the capital city of Tehran while Esfahani accent is spoken in Esfahan, the third largest city in Iran after Tehran and Mashhad, which was once one of the largest cities in the world. It is located at the intersection of the two principal north-south and east-west routes that traverse Iran. Both Standard and Esfahani accents have the same underlying phonological structure. In the earlier verities of Persian including the Standard and Esfahani accents, the vowel /a/ used to occur word-finally which changed to /e/ through time. Moreover, the synchronic occurrence of this process in other word positions is productive in the Esfahani accent which is regarded its well-known feature. However, presently, the vowel /e/ optionally changes to [a] in the environment before the postposition "râ" in both accents, as well as in other environments in the pronunciation of middle-aged and older Esfahani speakers. It is worth mentioning that the word "râ" is the only postposition in Persian formal pronunciation of which is never used in the spoken style. According to Jam (2017), this postposition is pronounced [ro] after words ending with vowels and [o] when it occurs after words ending with consonants. That is because a preceding consonant triggers /r/ deletion.

2- Methodology
This research aimed at introducing and analyzing this rule inversion within the framework of Optimality Theory (Prince & Smolensky, 1993/ 2004). Optimality theory is one of the most significant developments in generative grammar. The first detailed exposition of the theory appears in Prince and Smolensky's book(1993), entitled "Optimality Theory: Constraint Interaction in Generative Grammar". Its goal is to explain the phonology of languages only by using a set of universal constraints. No phonological rule is being applied in its analyses because they

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generally explained the language-specific phenomena. In contrast, constraints in OT are not merely solutions to language-specific problems; they are claims about Universal Grammar (UG) seeking to explain phonological phenomena universally. Furthermore, there is no interaction between rules and constraints, i.e., OT is not a mixed theory. The principles of SPE phonology (Chomsky & Halle, 1968) namely rules and serial derivations between underlying representation (UR) and phonetic representation (PR) have been abandoned by OT; however, UR and PR which are renamed as input and output respectively, are being assumed in the classical sense.

The optionality (also known as "free variation") in the change of /e/ to [a] in the standard and Esfahani accents is analyzed using the free ranking approach which maps a single input onto two outputs. Optionality is a case in which a single input is mapped onto two grammatical outputs, although their distribution is not under grammatical control. The fact that variation is "free" does not imply that it is totally unpredictable, but only that no grammatical principles govern the distribution of variants. Nevertheless, a wide range of extragrammatical factors may affect the choice of one variant over the other, including sociolinguistic variables (such as gender, age, and class), and performance variables (such as speech style and tempo). Extragrammatical variables affect the choice of occurrence of one output over another.

3- Conclusion
The Change of /e/ to [a] in the environment before the postposition "râ" in both standard and Esfahani accents as well as in different environments in Esfahani accent is a clear instance of rule inversion in Vennemann's (1972) sense. Vennemann (1972, 1974) (cited in Hulst 1980) regards rule inversion as restructuring and as such as part of a complicated type of change involving restructuring, loss of the original rule and addition of the inverted rule. He distinguishes two subtypes of rule inversion, dependent on the motivation of the change. In some cases, inversion is the direct result of restructuring. In other cases, inversion is the result of reinterpretation of the alternation that is caused by the original rule.

The primary reason for the occurrence of this phonological process, that is the change of /e/ to [a] in Esfahani accent in the pronunciation of middle-aged and older Esfahani speakers, is hypercorrection which is in turn due to comparing this accent with the standard accent for religious reasons, honor and reverence as well as the high prestige of the standard accent. This is true that coming up with an analysis for hypercorrection in OT is challenging; however, since /e/ optionally changes to [a] in certain generalizable environments in Esfahani accent, it is capable of being analyzed within OT using the free ranking approach.