International Journal of English Linguistics; Vol. 10, No. 4; 2020
ISSN 1923-869X E-ISSN 1923-8703
Published by Canadian Center of Science and Education

/dˤ/-Variation in Saudi Newscasting and Phonological Theory

Yasser A. Al-Tamimi[1]

[1] Department of Humanities and Social Sciences, Alfaisal University, Riyadh, Saudi Arabia

Correspondence: Yasser A. Al-Tamimi, Associate Professor of Linguistics, Department of Humanities and Social Sciences, Alfaisal University, Riyadh, Saudi Arabia. E-mail: yaltamimi@alfaisal.edu

Received: March 2, 2020 Accepted: April 4, 2020 Online Published: April 11, 2020

doi:10.5539/ijel.v10n4p11 URL: https://doi.org/10.5539/ijel.v10n4p11

Abstract

In his analysis of /dˤ/-variation in Saudi Arabian newscasting, Al-Tamimi (2020) finds unpredicatble variability between the standard variant [dˤ] and the non-standard variant [ðˤ] in different in-words positions, in different phonetic environments, and in semantically 'content' and suprasegmentally 'stressed' lexical itmes assumed to favor the standard variant. He even finds in many of these lexical items an unusual realizational flucatuation between the two variants. The present exploratory and 'theory-testing' study aims to find a reasonable account for these findings through examining the explanatory adequacy of a number of available phonological theories, notions, models and proposals that have made different attempts to accommodate variation, and this includes Coexistent Phonemic Systems, Standard Generative Phonology, Lexical Diffusion, Variable Rules, Poly-Lectal Grammar, Articulatory Phonology, different versions of the Optimality Theory, in addition to the Multiple-Trace-Model, as represented by Al-Tamimi's (2005) Multiple-Trace-Based Proposal. The study reveals the strengths and weaknesses of these theories in embracing the variability in the data, and concludes that the Multiple-Trace-Based Proposal can relatively offer the best insight as its allows variation to be directly encoded in the underlying representations of lexical items, a status strictly prohibited by the rest of the theories that adopt invariant lexical representations in consonance with the 'Homogeneity Doctrine'.

Keywords: /dˤ/-variation, lexical representations, Saudi newscasting, phonological theories, Multiple-Trace Model

1. Introduction

As variation is "an inherent characteristic of all languages at all times" (Wardhaugh & Fuller, 2015, p. 140), it tends to naturalistically unfold at different layers of linguistic analysis—phonological, morphological, syntactic, semantic, or lexical, and at different levels of sociolinguistic investigation. Hence, research on linguistic variation often portrays the phenomenon as systematically controlled by either linguistic or sociolinguistic constraints. Samara et al. (2017, p. 85), for instance, states that "the usage of linguistic variants tends to be conditioned, so that variation is rarely, possibly never, fully unpredictable". Similarly, Mougeon, Nadasdi and Rehner (2010, p. 2) claim that "with linguistic variation, alternation between elements is categorically constrained by the linguistic context in which they occur".

However, not all variation that exists in natural languages is as systematic as, for instance, the English regular past tense markers and the English final t/d- deletion which seem to reflect a deterministic linguistic conditioning. In fact, some variation can occur asymmetrically and in a manner refractory to any possible linguistic conditioning, and this can thus be categorised under what Boresma (1998, p. 329) called linguistically "unconditioned variability".

An interesting example of this type of variability is the capricious phonetic behaviour of the /dˤ/ sound found to noticeably occur in Saudi Arabian newscasting. Al-Tamimi (2020) finds the sound to be realized as the standard variant [dˤ] in around 70% of the time, and as [ðˤ] in around 30%, irrespective of the linguistic parameter used (i.e., different in-word position, different phonetic environment, and 'content' and 'stressed' words). That this variability has been found to recur in almost the very same percentages under all these linguistic parameters may cast doubt on the significance of linguistic conditioning for the phonetic behaviour of the sound. This is substantiated by the finding of realizational fluctuations between the two variants in many identical contents and stressed lexical items. So how can phonological theory embrace this unconditioned variability and explain this unusual fluctuation?

The present exploratory and 'theory-testing' study aims to find which phonological theory can best answer these challenging questions. This involves examining the explanatory adequacy of a number of phonological theories, notions, models and proposals that have made variable attempts to handle variation, including Coexistent Phonemic Systems, Standard Generative Phonology, Lexical Diffusion, Variable Rules, Poly-Lectal Grammar, Articulatory Phonology, different versions of Optimality Theory, in addition to the Multiple-Trace-Model, as represented by Al-Tamimi's (2005) Multiple-Trace-Based Proposal, claimed to provide better insight into the subject matter.

2. /dˤ/-Variation in Saudi Newscasting

Before discussing the variation in question, it is worth introducing the phonetic description of the two Arabic sounds involved- /dˤ/ and /ðˤ/. Table 1 below, as adapted from Ferrat and Guerti (2013), summarizes their articulatory properties.

Table 1. Phonetic description of /dˤ/ and /ðˤ/

Sound	Place of Articulation	Emphatic	Voiced	Plosive	Fricative
/dˤ/	Denti-Alveolar	+	+	+	-
/ðˤ/	Interdental	+	+	-	+

Al-Tamimi (2020) investigated the phonetic behavior of /dˤ/ in 20 randomly selected Saudi newscasts under different in-word positions (initial, medial and final), different phonetic environments (V-V, C-V, and V-C), and in 'stressed' and 'content' words, and finds:

a) variation between [dˤ] and [ðˤ] in all in-word positions, as demonstrated in Figure 1 below:

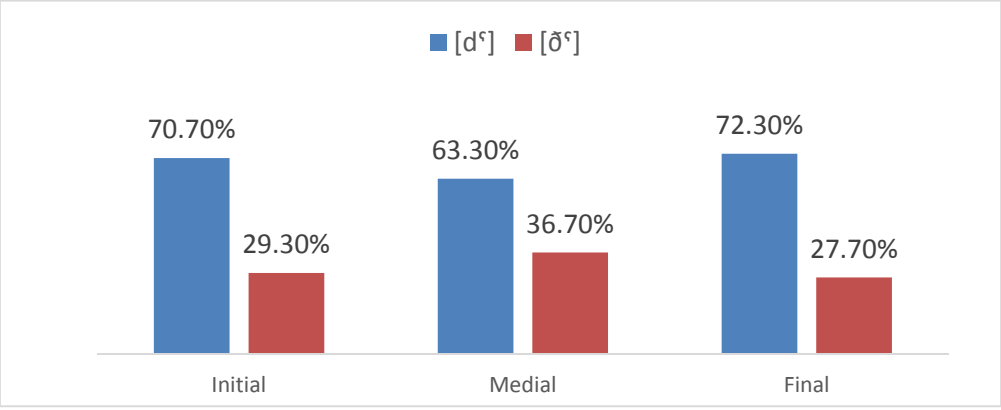

Figure 1. Summary of variants in all in-word positions (Al- Tamimi 2020)

b) no significant differences in the percentages of these realizations, whether /dˤ/ occurs word initially, medially or finally (P-Values were: 016 for initial vs. medial, 043 for initial vs. final, and 0.79 for final vs. medial); suggesting no influence from the in-word position on the sound's variation.

c) variation between [dˤ] and [ðˤ] in the different phonetic environments involved—V-V, C-V, and V-C, as demonstrated in Figure 2 below:

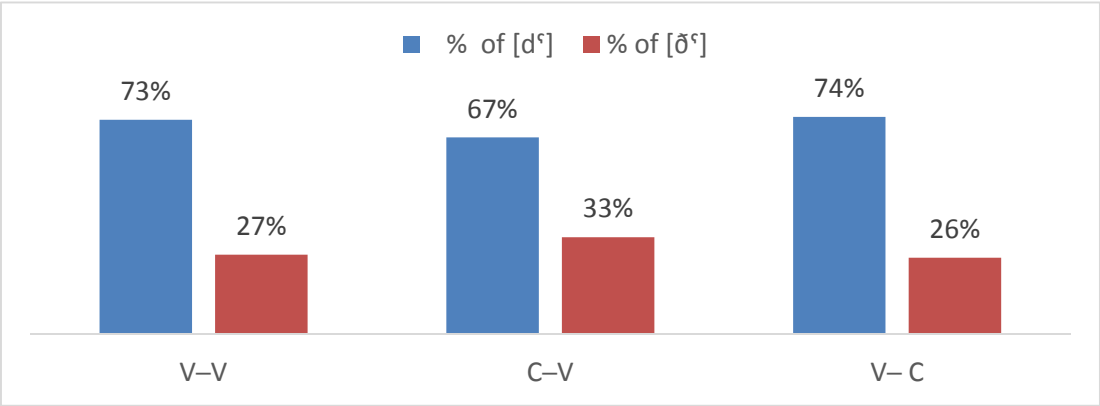

Figure 2. Summary of variants in phonetic environment (Al-Tamimi, 2020)

d) no significant differences in the percentages of the realizations of [dˤ], whether /dˤ/ occurs in a V-V, a C-V, or a V-C phonetic environment (P-Values were 0.294 for C-V vs. V-C, 0.17 for V-V vs. C-V, and 0.727 for V-V vs. V-C), pointing to no control from the phonetic environment on the sound's variation.

e) realizational fluctuations between the two variants in 'content' and 'stressed' words, where identical words classified under these categories were sometimes pronounced with [dˤ] and other times with [ðˤ], as exemplified below:

1) Examples of realized [dˤ] in the same 'content' and 'stressed' words:

a. /ħadˤara/(attended/waħa**dˤ**ara l ʔɪdʒtɪma:ʕa/(and attended the meeting…)

b. /ħadˤara:tɪkum/(your good selves)/nuqaddɪmu lɪ ħa**dˤ**ara:tɪkum/ (we present to your good selves)

c. /jandˤamm/(joins)/wa jan**dˤ**ammu ʔɪlajna:/(and joining us is…)

d. /alrɪja:dˤ/(Riyadh) /fi: madi:natɪ rrja:**dˤ** wa /(in Riyadh City and)

2) Examples of realized [ðˤ] in the same 'content' and 'stressed' words:

a. /ħadˤara/(attended)/kama: ħa**ðˤ**araha ʕadadun mɪna/(and it was also attended by a number of…)

b. /ħadˤara:tɪkum/(your good selves)/qaddamna: lɪ ħa**ðˤ**ara:tɪkum/(we presented to your good selves)

c. /jandˤamm/(joins)/wa jan**ðˤ**ammu ʔɪlajna:/(an joining us is…)

d. /alrɪja:dˤ/ (Riyadh/fi: mintˤaqat ɪ rrja:**ðˤ** wa/(in Riyadh Region and…)

Clearly, these findings point to linguistically unconditioned variability, and it would be interesting to know which phonological theory can best accommodate it, along with the realizational fluctuation in the 'inconsistent set', as exemplified in 1–2 above.

3. Review of Phonological Theories and the Status of Variation

Linguistic theories differ in the extent to which they can recognize and accommodate phonological variation, and with regard to the apparatus used. The theoretical linguistic disposition in the first half of the 20th century was much influenced by the Saussurean contrast between 'Langue' and 'Parole', which involved viewing grammar as invariant, thus omitting variation from its purview. That is, variation was held to be non-linguistic; hence outside 'Langue' (Guy, 1997, p. 128). Adopting the same linguistic tenet, both American and European structuralists postulate the existence of a single underlying phonemic system for all native speakers of the same language, known as the 'homogeneity doctrine'. Thus, Pike's (1948) notion of Coexistent Phonemic Systems can be regarded as one of the earliest courageous attempts to accommodate variation. Similarly, Chen and Wang's (1975) theory of Lexical Diffusion that gives "some theoretical status to variation" (McMahon, 1994, p. 51) stands in contrast to the Neogrammarian Hypothesis stating that a sound change applies simultaneously to all contextually eligible lexical items.

In generative grammar, and due to the pervasiveness of the classical dichotomy between 'competence' and 'performance' (that shares close resembalnce with 'Langue' and 'Parole', respectively), variation is often seen as irrelevant to the development of the linguistic theory which is defined as treating competence (Chomsky, 1965, p. 3). Although the existence of variation has been acknowledged since the beginning (Postal, 1966), it continued to receive little attention in mainstream generative phonology during the first 25 years of the history of this linguistic

paradigm (Coetzee & Kawahara, 2013). In Lexical Phonology, for instance, the status of variation was noticeably relegated as can be seen in the basic assumption of the theory: lexical rules apply obligatorily while "postlexical rules can be optional and subject to variation" (Kiparsky,1985, p. 86). However, since the rise of sociolinguistics in the 1960s, interest in linguistic variation (also called 'linguistic variability') has developed rapidly. According to Trask (1999, p. 221), "variation, far from being peripheral and inconsequential, is a vital part of ordinary linguistic behaviour". In the same line, Labov (1969), though still operating within the generativists' conventions, introduced the Variable Rule, a theroretical probabilistic model that views variability as an integral part of linguistic competence. Similarly, Bailey (1973) introduced his Poly-Lectal Grammar, a new theoretical framewek that considers variation as a ntural consequence of a speaker's competence in more than one variety of a language.

Two decades later, Optimality Theory (OT) in its original version was introduced, and contrary to some claims about the ability of its constraints to offer insight into variation (e.g., Rose, 1995), it appeared that its constraints hierarchies were incapable of modelling variation within one accent as its grammar was 'deterministic' in the sense that each lexical input was mapped onto a single phonetic output—the most harmonic candidate for a given constraint hierarchy (Kager, 1999, p. 404). Hence, different OT models were developed later on to provide better insight into variation, and these include Anttila's (1995) preferred vs. unpreferred constraints ranking, Reynolds' (1994) Floating Constraints, Boersma's (1998) Stochastic OT, and Coetzee and Kawahara's (2013) noisy Harmonic Grammar (HG).

In contrast to generative grammar and all its theoretical extensions introduced above, the 'Usage-Based' approach, or the Multiple-trace Model (MTM) considers language use (performance), rather than competence, as the primary concern of the linguistic theory, and thus gives primacy to learning and experience in language acquisition over positing innate linguistic structures. In other words, the approach, as introduced below, believes that variation embedded in performance is a key characteristic feature of language as well as a precondition to linguistic evolution (e.g., Bybee, 2001; Tupper, 2014). Hence, 'variability in the stimulus is directly encoded in the lexical representations" (Docherty & Foulkes, 2000, pp. 118–119). This characteristic feature might be regarded as a theoretical breakthrough towards accommodating variation, especially the linguistically unconditioned type (e.g., the /dˤ/-variation in question) deemed to pose challenge to the linguistic theory. Investing in this key feature, Al-Tamimi (2005) introduced a 'multiple-trace-based proposal', and claimed that it can offer better insight into this type of variability than the non-usage-based theories introduced above.

4. Methodology

This exploratory, or 'theory-testing' research required intensive reading, understanding and analysis of the different linguistic theories, notions and models that have made different attempts to handle variation. The key assumptions of these perspectives, features, and mechanisms (if any) were closely examined, and their relevance/irrelevance to the variation in question was concluded.

For organizational matters, the theoretical perspectives reviewed in the present study were categorized into two main categories. The first category represents what might be called the 'Non-Usage-Based' approach, and this, though arguably, comprises the traditional set: Coexistent Phonemic Systems, Standard Generative Phonology, Lexical Diffusion, Variable Rules, Poly-Lectal Grammar, Articulatory Phonology and the different versions/models of Optimality Theory, and the second catrgory is the 'Usage-Based' aprpoach, as represented by Al -Tamimi's (2005) Multiple-Trace- Based Proposal.

5. Testing the Relevance of the First Category

The readers' expected familiarity with the theories that belong to this category obviates the need for introducing their basic assumptions/mechanisms. Hence, the discussion below is restricted to pinpointing their relevance/irrelevance to embracing the Saudi variation in question.

5.1 Coexistent Phonemic Systems

According to Pike and Fries' (1965) notion, there coexist two phonemic systems which operate partly in harmony and partly in conflict in the speech of a monolingual native of a language. Thus, a Saudi newsreader, as 'a monolingual' native speaker of Arabic, possesses two coexisting systems (presumably that of Modern Standard Arabic that has /dˤ/ as a functional unit, and that of his Saudi dialect that systematically has /ðˤ/ instead (Al Sharif, 2017)). This notion, reminiscent of Ferguson's (1959) view of diglossia, may offer a broad perspective into the subjects' variation between [dˤ] and [ðˤ] in different in-word positions and in different phonetic environments where different words were variably realized (e.g., [ʔa**d**ˤraːr] 'damages' and [ʔaf**ð**ˤal] 'better'). However, the notion can provide no insight into the subjects' variability in the 'inconsistent set', where the same 'content and

stressed' word was pronounced sometimes with [dˤ] and other times with [ðˤ] (e.g., [ħadˤara] 'attended' vs. [ħaðˤara] 'attended').

5.2 Standard Generative Phonology (SGP)

SGP can handle conditioned variability (which does not exist in our data) through its obligatory phonological rule that operates on all input strings that satisfy its structural description. However, as for unconditioned variability, the best that the theory can offer is an optional rule that may or may not apply to lexical items whose underlying representations are identical across all speakers of the same language in fulfillment of the homogeneity doctrine introduced above. That is, the optional rule operates blindly on idealized /dˤ/—lexical entries, and none of the speakers' knowledge of when to apply the rule is represented. As such, the theory cannot explain the unconditioned occurrence of the variants in the data.

5.3 Variable Rules

A major shortcoming of Labov's (1969) variable rule is its postulation of a probabilistic competence judged to constitute a violation to a fundamental belief about human psychology. According to Romaine (1982, p. 251):

> "To describe the utterances of speakers/groups in terms of probabilistic laws which are said to be variable rules in a model of grammar is one thing; but to project such rules onto the competence of individual speakers of a language, and then to suppose that speakers or their mental capabilities are in any way constrained by them is, in my opinion, methodologically inadmissible".

Thus, the percentages of occurrence of the variants [dˤ] and [ðˤ] as well as the 'inconsistent set' can only be portrayed/ presented using the variable rule's formal notations, but cannot be methodologically explained by its probabilistic constraints.

5.4 Poly-Lectal Gramar

In Bailey's (1973) Poly-Lectal Grammar, variability is a natural outcome of a speaker's competence in more than one variety of a language. This may hold true for our Saudi subjects who, being in a diglossic situation, possess two varieties of Arabic. The first is their Saudi dialect in which /dˤ/ is constantly realized as [ðˤ] (Alsharif, 2017), and the second is Modern Standard Arabic (MSA), in which /dˤ/ is typically realized as [dˤ]. MSA is a "highly codified" variety and a "grammatically more complex", 'learned largely by formal education" (Ferguson, 1959, p. 35), and must be spoken in formal contexts, including news casting (ibid). Hence the Saudi subjects, according to this perspective, have competence in more than one grammar/lexicon: grammar/lexicon 1 may yield /dˤ/→ [ðˤ], whereas grammar/lexicon 2 may give /dˤ/→ [dˤ], respectively. This may provide some insight into the occurrence of the variants in the percentages demonstrated above, but it cannot shed light on the 'inconsistent set'. In all cases, the approach lacks a formal implementation mechanism.

5.5 Lexical Diffusion

From the perspective of this theory as introduced by Chen and Wang (1975), and assuming for the sake of argument that /dˤ/→ /ðˤ/ change is in an ongoing process of lexical diffusion in MSA, we can only conclude that /ðˤ/ has diffused into all the words pronounced with [ðˤ] in the data (30%), and has not yet diffused in all the words pronounced with [dˤ] (70%). This, if were true, may explain the unconditioned occurrence of both variants, but it provides no insight into the 'inconsisten set'.

5.6 Articulatory Phonology

AP is said to explain different types of phonological variation through its key assumption that increase in overlap and reduction in the magnitude of individual gestures underlie a variety of phonological processes (Browman & Goldstein, 1990). Hence, the variant [ðˤ] in the data might be seen as the outcome of the phonological substitution /dˤ/→ [ðˤ] resultant from some reduction in the magnitude of the /dˤ/ gesture, a reduction probably triggered by the 'principle of least effort', and facilitated by the articulatory or 'gestural' similarities between /dˤ/ and /ðˤ/, as both are [+ emphatic], [+ anterior], and [+ voiced]; and the only articulatory difference between them lies in the manner of articulation; where the former is [+ plosive] and the latter is [+ fricative] (Al Sharif, 2017). The variant [dˤ], on the other hand, is the output of the non-execution of the assumed substitution process. It may thus be concluded that the occurrence of both variants in the data is correlated with the execution or non-execution of the substitution process, and this is reminiscent of the optional rule of the standard generative approach and its shortcomings in handling variations. In fact, AP does not seem to have an obvious mechanism for explaining the unconditioned variations in the data, especially the 'inconsistent set'.

5.7 Optimality Theory and Subsequent Versions

As stated above, and in agreement with Kager (1999), the constraints hierarchies of the original version of OT are

incapable of modelling variation within one accent as its grammar is 'deterministic' in the sense that each lexical input is mapped onto a single phonetic output—the most harmonic candidate for a given constraint hierarchy. Subsequent efforts towards enabling the theory to account for variation include Anttila's (1995) preferred vs. unpreferred constraints ranking, Reynolds' (1994) Floating Constraints, Boersma's (1998) Stochastic OT, and Coetzee and Kawahara's (2013) noisy Harmonic Grammar (HG). As these models have attempted though variably to accommodate what Anttila (2002, as cited in Coetzee & Kawahara, 2013) called the 'locus of variations' (i.e., where variation is observed and where it is not), and the 'degree of variations' (the frequency of different variants), they are judged to provide better insight into variations (see Coetzee & Kawahara, 2013 for a review). However, despite this progress in enabling the theory to accommodate variation, none of these versions can provide a clear explanation for the capracious phonetic behaviour of the sound in the 'inconsistent set'.

From the foregoing, we can conclude that none of these theories has offered a complete account for the unconditioned variability in the data, especially the 'inconsistent set'. This is likely because almost all these theoretical constructs, particularly those molded in the generative paradigm, are mainly grammatical models that do not internalize any effect of non-grammatical elements on variation. This has been in fact the status quo in mainstream theories despite the amassing evidence that variation can be inevitably influenced by both grammatical, and non-grammatical factors which include, according to Bayley (2002, p. 18), genre (e.g., read speech, word lists, informal conversations), and discourse situation (e.g., age, gender, educational background, ethnicity, etc.). Recognising the impact of such non-grammatical factors on variation, and considering it as an integral component of grammar, the Multiple-Trace-Model (MTM) may offer a better insight into the variation in question.

6. Testing the Relevance of the Second Category

As stated above, the second category includes the Multiple-Trace-Theory, and Al-Tamimi's (2005) Multiple-Trace-Based Proposal. As these are not as familiar as the components of the first category, they will be briefly introduced below, and the relevance of the proposal to embracing the variation in question will be discussed afterwards.

6.1 The Multiple-Trace Model: Basic Assumptions and Implications

The key assumption of the Multiple-Trace-Model (MTM) is that listeners do store pecific instances of the words that they have heard/recognized (Jusczyk, 1997). This implies that variability is directly encoded in the lexical representations of these words. Some scholars claim that this places a great demand on memory (e.g., Johnson, 1997), while others argue that there is enough memory available to allow some version of an exemplar repetition (e.g., Bybee, 2001). However, the MTM is supported by ample evidence suggesting that indexical information (such as gender, accent, speakers' voice, etc.) held to be unconnected to speech perception or word recognition do appear to play a crucial role in decoding the linguistic properties of the speech signal (Pizoni, 1997). Such evidence, according to Docherty and Foulkes (2000, p. 119), has given rise to the MTM as " a reasonably plausible theory of lexical representation".

Thus, in the MTM, the lexical representation for a word, such as 'economics' is equal to the sum of traces being stored for the word, and this presumably includes traces for the word once heard as /ˌekəˈnɒmɪks/ (with the initial "mid-close vowel- /e/"), as well as traces for the word when heard as /ˌiːkəˈnɒmɪks/ (with the initial "high front vowel- /iː/"). In this context, Fowler (1996, p. 237) states that the use of any of these forms is a "matter of preference", and he expresses his preference to use /ˌiːkəˈnɒmɪks/. This echoes Wells' (1990, p. 234) consideration of /ˌiːkəˈnɒmɪks/ as "the base form in British English (BRE), and /ˌekəˈnɒmɪks/ as a variant pronunciation". This, adds Wells, was substantiated by the results of a BRE poll panel preference which allocate 62% for /ˌiːkəˈnɒmɪks/ and the remaining 38% for /ˌekəˈnɒmɪks/. So, according to the MTM, a person exposed to both forms with these frequencies will develop a complex lexical representation that includes both traces for the word, as represented in Figure 3 below:

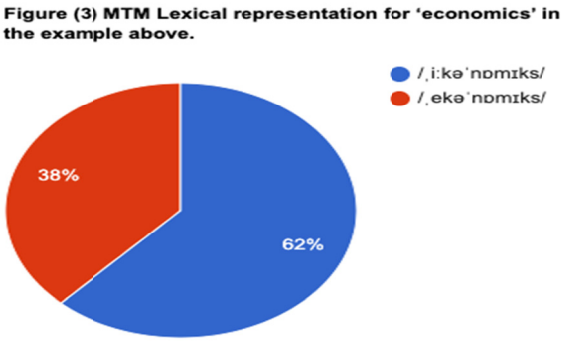

Figure 3. MTM Lexical representation for 'economics' in the example above

Clearly, this MTM view of lexical representation is at sharp contrast with the generativists' pervasive doctrine of invariant lexical representations known as the 'Uniqueness Hypothesis' which suggests that the speakers' knowledge of their lexicon is exclusively embedded in a set of unique representations for lexical items.

6.2. Al-Tamimi's (2005) Multiple-Trace-Based Proposal

Investing in the MTM's view of lexical representations, and making use of some pertinent and insightful remarks in the literature, Al-Tamimi (2005) introduced a multiple-trace- based proposal (henceforth MTBP) to account for linguistically unconditioned variability, as demonstrated in Figure 4 below.

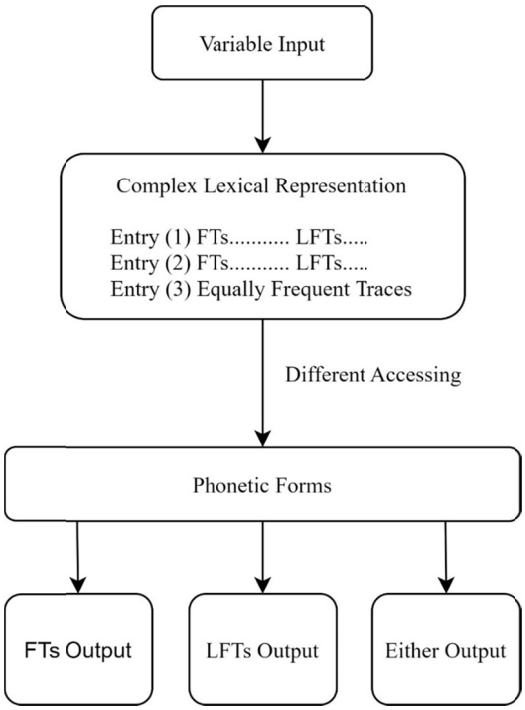

Figure 4. Al- Tamimi's (2005) MTBP

As can be seen in Figure 4 above, the MTBP has three basic components: (1) Variable Input, (2) Complex lexical representations, comprising (a) frequent traces (FTs) for each lexical entry and (b) less frequent traces (LFTs) for the same entry, and c) equaly-trace-represented lexical items, and (3) Output: phonetic forms imaging a prior accessing of either the FTs, LFTs or the equally trace represented items. The Variable Input is based on the assumption that speakers of the same language may not necessarily acquire the same representation for individual

lexical items. Hence, the variable input can help explain (a) across speakers' variability and (b) within speaker's variability (Al- Tamimi, 2005).

In the MTBP, the mapping between complex lexical representations and the phonetic forms is straightforward and this obviates the need for phonological rules deemed inevitable if invariant and abstract lexical representations are posited. Thus, the proposal adopts Kenstowicz and Kesseberth's (1977) notion of the "Identity Condition" which "allows the minimum divergence between lexical representations and their associated phonetic forms" (Al-Tamimi, 2005). This adoption is consistent with the flexible nature of the MTM's view of lexical representation, with some views that call for positing pronounceable lexical representations, and with some arguments that cast doubt on the validity of rules, such as the one below:

> "In recent years, the biological and epistemological underpinnings of rules have become increasingly shaky and vulnerable…No developmental psychologist ever observed a child learning a rule…No neuroscientist ever traced the neural substance of a rule…Attempts in the 1970s to demonstrate the psychological rules in adults (Fodor, Bever, & Garrett, 1974; Linell, 1977; Ohala, 1974a, b, c; Trammell, 1978) yielded uniformly disappointing results" (MacWhinny, 2000, p. 122, cited in Al Tamimi, 2005, p. 76).

The MTBP categorizes the traces of a given lexical item into three main categories and defines them as follows:

a) Frequent Traces (FTs): the traces speakers tpically tend to access most of the time (e.g., in casual speech)

b) Less Frequent Traces (LFTs): the traces speakers typically tend to access on particular occasions (e.g., reading aloud)

c) Equally Frequent Traces: a condition when a lexical item has more than one variant, where each roughly has an equal number of traces. That is, different variants of the same lexical item may have similar representational strengths.

Having found this MTBP useful in explaining some linguistically unconditioned variability in the glottal fricative 'h' as realized in the East End of London, Al-Tamimi (2005) calimed that it can offer better insight into such variation than all theories that adopt invariant lexical representations, such as the ones reviewed above and found to stop short of accommodating the data in question.

6.3 The Relevance of the MTBP to /dˤ/-Variations

As stated above, due to their diglossic situation, the Saudi newsreaders possess two varieties of Arabic: High (H) and Low (L) (to use Ferguson's (1959) terms). The H variety is more prestigious and typically used in formal contexts, including newspaper editorials, news stories, and news broadcast (among many other formal contexts specified by Ferguson, 1959). The L variety, on the other hand, is typically used for informal spoken purposes in everyday household conversations (Ibid).

Consequently, in the H variety, in general, and in newscasting, in particular, which is recognized as 'monitored" speech, and thus ranked as "one of the highest formal speech types" (Trudgill, 1974, pp. 48–50), /dˤ/ is expected to be constantly realized as [dˤ]. In the L variety (the Saudi variety), on the other hand, /dˤ/ is anticipated to be permanently realized as [ðˤ] (Alsharif, 2017). Thus , and from the perspective of the MTBP, the Saudi subjects have over the years internalized into their lexical representations traces for 'dˤ'—lexical items with both realizations [dˤ] and [ðˤ]. However, as the subjects are more frequently exposed to the L variety, they have presumably internalized more traces for words with [ðˤ] than traces for words with [dˤ]. Hence their Frequent Traces (FTs) typically include [ðˤ] forms of 'dˤ'—words, while their Less Frequent Traces (LFTs) typically include the [dˤ] forms of these words.

Now to explain the variability in the data, we assume that while reading the news**,** the subjects were very much keen on producing [dˤ] forms, and this required continuous attention and 'going against the grain" to access the LFTs that include these forms. A slightly less attentive performance , though, might have redirected access into their FTs which include [ðˤ] forms. This is, in a sense, analogous to a tug of war between the colloquially frequently used variant and the more specific target. They would be pulling, in this instance, towards the standard variant. Losing grip would render their pronunciation towards that of the looser variant, and the more attentive they are to exact articulation, they are more likely to enunciate the targeted variant. More specifically:

1) When the subjects realized the standard variant [dˤ] in 70% of the time (irrespective of in-word position, phonetic environmet, or if the lexical item involved is semantically content or suprasegmantlly stressed) , they were redirected/forced by the formality of the situation to access the LFTs of these 'dˤ'— words .

2) Conversely, when the subjects realized the non-standard variant [ðˤ] in 30 % of the time (irrespective of all the linguistic parameters specified in (1) above), they were accessing the FTs of these words.

3) The unusual variability between [dˤ] and [ðˤ] in the 'inconsistent set' might be attributed to having equally—trace represented items. That is, the frequency of the [dˤ] traces and the [ðˤ] traces of a given a lexical item belonging to the set is almost the same, and the subjects therefore had the choice to access either source.

In view of the forgoing, the MTBP seems to provide a reasonable account for the variation in the Saudi newsreaders' data, and to offer better insight into them than all the theories and notions reviewed above under the 'non-usage-based' approach. This explanation could have been more persuasive if substantiated by a quantitative evidence of the frequency of 'dˤ' and [ðˤ] words in both Modern Standard Arabic and the Saudi Variety, but, unfortunately, such evidence is not available for the lack of specialized databases. Also to enhance the explanatory adequacy of the MTBP, there needs to a threshold beyond which a form can be regarded as the standard variant and below which as a non-standard variant, and this is recommended for future research.

7. Conclusion

The study reveals the strengths and weaknesses of a number of phonological theories, notions, and models in embracing the Saudi newsreaders' variability between [dˤ] and [ðˤ] as concluded by Al-Tamimi (2020) to be linguistically unconditioned and challenging, especially in the 'inconsistent set'. Amongst these theories, the Multiple Trace Model as represented by Al-Tamimi's (2005) MTBP seems to relatively offer a more reasonable insight into the subject matter as its allows variation to be directly encoded in the underlying representations of lexical items, a recognition strictly prohibited by the rest of the theories as they typically adopt invariant lexical representations in consonance with the 'Homogeneity Doctrine'.

However, for a better and more accurate insight, the proposal needs to be empowered by a threshold beyond which a form can be regarded as the standard variant and below which as a non-standard variant. Also, the availability of frequency databases can add to the insight the proposal can provide.

References

Al Sharif, N. (2017). *Aldhaadu fill lughati il' arabiyyah*. MA thesis. Islamic University, Gazza

Al-Tamimi, Y. (2005). A Multiple-Trace-Based Proposal for Linguistically Unconditioned Variability. *International Journal of Arabic-English studies*, *6*, 71–84

Al-Tamimi, Y. (2020). /dˤ/-Variations in Saudi Arabian Broadcasting and Linguistic Conditioning. *Jordan Journal of Modern Languages & Literature*.

Antilla, A. (1995). *Deriving Variations from Grammar: A Study of Finish Genitives*. Ms., Stanford University. Retrieved Feb. 6, 2020, from http://roa.rutgers.edu/files/63-0000/63-0000-ANTTILA-0-0.PDF

Bailey, C. (1973). *Variation and Linguistic Theory*. Arlington, Virginia: Center for Applied Linguistics.

Bayley, R. (2002). The Quantitative Paradigm. In K. C. Jack, T. Peter & S.-E. Natalie (Eds.), *Handbook of Language Variation and Change* (pp. 117–141). Oxford: Blackwell. https://doi.org/10.1111/b.9781405116923.2003.00009.x

Boersma, P. (1998). *Functional Phonology: Formalising the Interaction between the Articulatory and Perceptual Drives*. Hague: Holland Academic Graphics.

Browman, C., & Goldstein, L. (1990). Tiers in Articulatory Phonology, with some Implications for Casual Speech. In J. Kingston & M. E. Beckman (Eds.), *Papers in Laboratory Phonology 1: Between the Grammar and Physics of Speech* (pp. 341–376). Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511627736.019

Bybee, J. (2001). *Phonology and Language Use*. Cambridge. Bloomington: Indiana University Press. https://doi.org/10.1017/CBO9780511612886

Chen, M., & Wang, W. (1975). Sound change: Actuation and implementation. *Language*, *51*, 255–281. https://doi.org/10.2307/412854

Chomsky, N. (1965). *Aspects of the Theory of Syntax*. Cambridge, MA.: MIT Press. https://doi.org/10.21236/AD0616323

Coetzee, A., & Kawahara, S. (2013). Frequency Biases in Phonological Variation. *Natural Language and Linguistic Theory*, *31*, 47–89. https://doi.org/10.1007/s11049-012-9179-z

Docherty, G., & Foulkes, P. (2000). Speaker, Speech, and Knowledge of Sounds. In N. Burton-Roberts, P. Carr & G. Docherty (Eds.), *Phonological Knowledge: Conceptual and Empirical Issues* (pp. 105–129). Oxford: Oxford University Press.

Ferguson, C. (1959). Diglossia. *Word*, *15*(2), 325–340. https://doi.org/10.1080/00437956.1959.11659702

Ferrat, K., & Mhania, G. (2013). Classification of the Arabic Emphatic Consonants using Time Delay Neural Network. *International Journal of Computer Applications*, *80*(10), 1–6. https://doi.org/10.5120/13894-9341

Fowler, H. (1996). *The New Fowler's Modern English Usage*. Oxford: Oxford University Press.

Guy, G. (1997). Competence, Performance, and the Generative Grammar of Variation. In F. Hinskens, H. R. Van & W. L. Wetzels (Eds.), *Variation, Change and Phonological Theory* (pp. 125–143). Amsterdam, Philadelphia: John Benjamins Publishing. https://doi.org/10.1075/cilt.146.07guy

Johnson, K. (1997). Speech Perception without Speaker's Normalization: An Exemplar Model. In K. Johnson & J. W. Mullennix (Eds.), *Talker Variability in Speech Processing* (pp. 145–165). San Diego, London: Academic Press.

Jusczyk, P. (1997). *The Discovery of Spoken Language*. Cambridge, MA.: MIT Press.

Kager, R. (1999). *Optimality Theory*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511812408

Kiparsky, P. (1985). Some consequences of Lexical Phonology. *Phonology Yearbook*, *2*, 85–138. https://doi.org/10.1017/S0952675700000397

Labov, W. (1969). Contraction, deletion, and inherent variability of the English copula. *Language*, *45*, 715–762. https://doi.org/10.2307/412333

McMahon, A. (1994). *Understanding language Change*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9781139166591

Mougeon, R., Nadasdi, T., & Rehner, K. (2010). *Sociolinguistic Competence of Immersion Students*. Bristol, UK: Multilingual Matters. https://doi.org/10.21832/9781847692405

Pike, K., & Fries, C. (1972). Co-existent phonemic systems. In R. M. Brend (Ed.), *Selected Writings* (pp. 51–73). The Hague: Mouton (An abstract of this paper was presented to the summer meeting of the Linguistic Society of America, July 31, 1948).

Pisoni, D. (1997). Some Thought on 'Normalisation' in Speech Perception. In K. Johnson & J. W. Mullennix (Eds.), *Talker Variability in Speech Processing* (pp. 9–32). San Diego, London: Academic Press.

Postal, P. (1966). Review of "Elements of general linguistics" by André Martinet. *Foundations of Language*, *2*, 151–186.

Reynolds, B. (1994). *Variation and phonological theory*. Ph.D. dissertation. University of Pennsylvania.

Romaine, S. (1982). *Socio-historical Linguistics*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511720130

Rose, S. (1995). Dialect Variation and Transparancy: The Role of Constraints. In P. Koskinen (Ed.), *Proceedings of the 1995 Annual Conference of the Canadian Linguistic Association*. L'Université du Québec à Montréal.

Samara, A. et al. (2017). Acquiring Variation in an Artificial Language: Children and Adults are Sensitive to Socially Conditioned Linguistic Variation. *Cognitive Psychology*, *94*, 85–114. https://doi.org/10.1016/j.cogpsych.2017.02.004

Trask. R. (1999). *Key Concepts in Language and Linguistics*. Routledge: London & New York.

Trudgill, P. (1974). *The Social Differentiation of English in Norwich*. Cambridge: Cambridge University Press.

Tupper, P. (2014). Exemplar Dynamics Models of the Stability of Phonological Categories. *Journal on Applied Mathematics*, *4*(75), 1469–1492.

Wardhaugh, R., & Fuller, J. (2015). *An Introduction to Sociolinguistics* (7th ed.). John Wiley & Sons, Inc. Wiley Blackwell.

Wells, J. (1990). *Longman Pronunciation Dictionary*. Harlow: Longman. https://doi.org/10.1177/003368290021002008

Copyrights

Copyright for this article is retained by the author, with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (http://creativecommons.org/licenses/by/4.0/).