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What is required is a sociolinguistic analysis of the native
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being transferred to English. (Author)

SOCIOLINGUISTIC VARIATION AND LANGUAGE TRANSFER
IN PHONOLOGY

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ABSTRACT

This article investigates a specific foreign language (FL) learning problem, the substitution of /s,z/ for English /θ,δ/ by native speakers of Egyptian Arabic, and concludes that the facts are better explained in terms of language transfer than by an explanation in terms of inherent difficulty independent of native language. A careful contrastive analysis can make quite precise predictions about the substitution that is made, the learners who make such substitutions and the circumstances under which the substitution is most common. However, it is argued that for the present case a contrastive analysis of the conventional kind, comparing native and target language as static systems, is useless. What is required is a sociolinguistic analysis of the native language, as it is a pattern of sociolinguistic variation which is being transferred to English.

Sociolinguistic Variation and Language Transfer in Phonology

Richard W. Schmidt

Introduction

Exaggerated claims for the predictive power of contrastive analysis are no longer fashionable. On the contrary, virtually all researchers in the field would agree that not all second language errors have their source in the learner's native language, and many would agree that "a majority of students' deviations or 'errors' are attributable to intralanguage interference rather than to mother tongue interference" (Scott and Tucker, 1974.70).

Recent studies of second language acquisition have tended to imply that contrastive analysis may be most predictive at the level of phonology, yet even in this area considerable skepticism remains. This may be due at least partly to the failure of contrastive analyses to provide reliable or complete predictions:

> For although a differential description of English and French for example, may indeed point out the fact that a French learner of English may have difficulty pronouncing the interdental sounds of thin and then because of their absence from the French phoneme inventory, it cannot predict as well as can the experienced teacher which way a given learner or group of learners will handle the difficulty. In point of fact, different learners with the same native language do make different mistakes; the above interdental sounds, for example, are rendered sometimes as /s,z/, sometimes as /t,d/. But this information is supplied, not by an a priori comparison of English and French, but by the observations of language teachers.

(Mackey, 1966.8-9)

It is also true, as Tarone (1976) points out, that while many papers have been written claiming to predict performance on the basis of contrastive analysis, few of these have presented systematically gathered and analyzed data to validate the predictions made. Tarone calls for a systematically gathered data base against which various theories of interlanguage phonology could be tested, including the relative importance of language transfer from the native language, the reactivation of first language

acquisition processes (the extent to which the second-
language learner behaves like the first-language learner),
and -- possibly -- other processes traceable neither to
language transfer nor to the re-activation of first-language
processes and strategies (Tarone, 1976.91).

The purposes of this paper are, first, to demonstrate
that a careful contrastive analysis can indeed predict
some facts about interlanguage phonology in a rather
precise manner and, second, to argue that at least for
certain types of foreign language (FL) learning problems
a more sophisticated type of contrastive analysis than
that generally used or assumed must be developed. The FL
learning problem to be examined here is the substitution of
/s,z/ for English /θ,δ/ by native speakers of Egyptian
Arabic. The refinement required in the contrastive analysis
is the recognition that neither the target language (English)
nor the native language (Arabic) can usefully be described
as a self-contained, homogeneous and static system, used
by idealized speaker-hearers in a homogeneous speech
community. In the case of Arabic, it may not even be very
useful to talk about two such self-contained systems, i.e.
colloquial and classical Arabic, in terms of the diglossia
model (Ferguson, 1959).

Background of the Present Study

The FL learning problem. Teachers of English to
native speakers of Egyptian Arabic are well aware of the
fact that the majority of their students will have difficulties
with English /θ/ and /δ/ and will often substitute /s/ and
/z/, respectively. This fact has been noted by innumerable
observers and generally has been accounted for in contrastive
analyses of English and Egyptian Arabic by the observation
that the English interdental fricatives have no counterparts
in colloquial Cairo Arabic. The problem is therefore
seen as a basic phonemic error of the type in which the
target language has a phoneme unmatched in the phonemic
inventory of the native language (Todaro, 1970).

The problem with the explanation provided by this
type of contrastive analysis is that classical Arabic does
have the interdental fricatives /θ/ and /δ/ (as well as a
third, emphatic interdental /δ̣/). It ought to be the case,
therefore, that students who are literate in Arabic and who
have been exposed to Classical Arabic will have little or
no difficulty with these English fricatives. But as Todaro
and others have pointed out, this is simply not the case
(Todaro, 1970.32). Lehn and Slager observe that even if
the student has been exposed to the /θ,δ/ sounds of classical
Arabic, in English "he has usually substituted /s,z/ while
labouring under the illusion that he was saying something
else" (Lehn and Slager, 1959.28).

4

In other words, given two types of learners,
illiterate and literate, one must claim that both groups
exhibit phonological transfer from colloquial Arabic only.
This is a totally ad hoc explanation, unfortunately,
since there may be other mistakes made by literate learners
for which interference must be claimed to originate in the
classical rather than the colloquial variety of the native
language (Kaplan, 1967; Richards, 1973.124-7). These
facts are an embarrassment to a theory of contrastive
analysis which claims to predict learners' errors. A
comparison of classical and colloquial Arabic and English
also fails to explain the fact that while colloquial
Egyptian Arabic has both sibilant and stop reflexes for the
etymological (classical) interdentals only sibilant
substitutions have been reported in the English of these
speakers.

One is tempted to look for other explanations.
Since the English interdental fricatives cause problems
for learners who speak many different native languages
(French, Russian, Japanese, Spanish, etc.), an explanation
in terms of inherent difficulty, independent of the learner's
native language, is attractive. In discussing the phonology
of Erica, a two-year-old native speaker of American English,
Moskowitz (1970) has suggested that production problems
with the interdentals and other fricatives are primarily
due to lack of sufficient motor control -- an inability
to maintain the articulators in as finely adjusted position
as is required. Menyuk (1968), following many other
observers, reports that /θ,ð/ are the sounds mastered last
and substituted most frequently by English native speakers
and further reports that it is the distinctive features
± continuant (the feature which differentiates /θ,ð/ from
/t,d/) and ± strident (differentiating /θ,ð/ from /s,z/)which
are the features last mastered by native speakers of English.

However, in the present case, it is this writer's
opinion that an explanation based on general developmental
processes is less satisfactory than an explanation based
on direct interference from the native language. The
identification of the source of Egyptian students' difficulties
with English th-words is suggested by Harrell's observation
that "for the Egyptian, /θ/ and /ð/ are merely super-careful
stylistic variants of /s/ and /z/ in certain words" (Harrell,
1960.69). This brief statement requires explanation. The
remainder of this paper will deal with the historical
origins of the relevant fricative-stop-sibilant alternations
in Egyptian Arabic, the ways in which these segments
function synchronically as sociolinguistic variables, and
the degree of similarity between student performance in
Arabic and in English with respect to these variables.

Historical background. Two diachronic changes have
affected the classical Arabic fricatives /θ, δ, ʂ / in the
development of the Egyptian dialect. An early historical
rule merged these three segments with the stop series
/t,d,d/:

Classical Arabic		Egyptian colloquial Arabic
'thick'	θaxi:n	tixi:n
'more'	ʔakθar	ʔaktar
'wolf'	δiʔb	di:b
'back'	ʂahr	dahr

At some point in time, this sound change ceased to
operate. Words which were then borrowed (or re-borrowed)
from the classical into the colloquial lexicon instead
underwent a new sound change, merging the interdentals
/θ,δ/ with the sibilants /s,z/ and creating a new emphatic
sibilant /z/ as the reflex of /ʂ/:

Classical Arabic		Egyptian colloquial Arabic
'to act'	maθθal	massil
'to mention'	δakar	zakar
'great'	ʕaδi:m	ʕazi:m

Although it is not possible to date either of these
rules precisely, there is no doubt about their relative
chronology. Birkeland (1952) points out that the change
from interdental fricatives to stops is common to Lower and
Upper Egypt and so must be presumed to have taken place
as soon as a distinctive Egyptian Arabic dialect was being
formed. The beginning date of the interdental fricative
to sibilant change cannot be pinpointed with any precision,
but Birkeland gives some evidence ordering the change between
the two rules known to have operated after the 14th century.

For contemporary colloquial Egyptian Arabic,
Robertson (1970.147) has observed that "there seems to be
no rule as yet for determining which sound will prevail
in a given word". This is true in the sense that there
are no phonological or other linguistic conditioning
factors involved; both the first and the second diachronic
changes were unconditioned. What is equally true, however,
and important for the present discussion, is that the
change from interdental fricatives to stops is no longer
operating in Egypt. Words that have not been in the colloquial
vocabulary for a long time -- including newly coined
technical terminology, some older words that are generally
acquired by native speakers only through formal education or
formal channels, retaining their character as learned words,
and foreign borrowings -- cannot now be colloquialized
with stops. Since this rule is no longer productive, there
is no reason to predict any transfer effect from it to a
foreign language. The change of fricatives to sibilants
remains a productive rule in Egypt, on the other hand, and
any classical Arabic word with /θ, δ, ʂ/ may be colloquialized

with /s,z,z̲/; e.g. /mumaθθil/~/mumassil/, 'actor', but
not */mumattil/; /θawra/~/sawra/, 'revolution', but not
*/tawra/.

   Synchronic sociolinguistic variation.   As a result of
the two historical sound changes discussed above, there are
in contemporary Egyptian Arabic numerous lexical triplets
with interdental fricative, sibilant and stop variants,
e.g., /θa:liθ/~/sa:lis/~/ta:lit/, 'third'. Both linguists
and native speakers tend to identify such variants with
different linguistic systems (i.e., classical and colloquial)
and to assign the alternations to code switching, code
mixing or free variation. The important fact to note,
however, is that such switching and mixing is orderly rather
than random, and the variation is not really free. These
alternations constitute, in Labov's terms, a sociolinguistic
variable -- "one which is correlated with some non-linguistic
variable of the social context: of the speaker, the addressee,
the audience, the setting, etc.." (Labov, 1970.192).

   The present writer has investigated the stylistic use
of interdental fricative, sibilant and stop pronunciations
in lexical items with potential interdentals (hereafter
referred to as the Arabic TH-variable) among 16 university
students and 12 working class males with secondary education
or less in Cairo (Schmidt, 1974). In each of four discriminable
styles -- relatively informal interview speech, formal
interview style, reading passages and word lists -- a
distinctive distribution pattern appeared.

   As Table 1 shows, different pronunciations of the
Arabic TH-variable predominated in different styles.
Interdental fricatives accounted for slightly more than
half of all realizations of the TH-variable when reading
from word lists, but in no other style. Sibilants pre-
dominated when reading from texts. Stops did not occur at
all in the reading styles, but prevailed in the relatively
casual parts of the oral interview. Stop and sibilant
pronunciations were about equal in the more formal parts
of the interview.

Table 1:   Pronunciation of the Arabic TH-variable in
           Various Styles -- All Informants (Schmidt,1974.95)

	Informal interview speech	Formal interview speech	Reading passage	Reading word lists
Interdental fricatives	--	4%	39%	56%
Sibilants	22%	45%	61%	44%
Stops	78%	51%	--	--

The same general pattern -- an increase in sibilant
pronunciation in the middle of the stylistic continuum and
increases in fricative and. stop pronunciations at the formal
and informal ends, respectively-- held for both informant
groups. There was, however, a striking difference between
the two socio-economic groups studied. While all of the
university students produced at least some instances of
interdental pronunciations, seven of the twleve working
class informants produced no interdentals at all. Those
working class informants who did produce some instances
of the classical interdentals did so less than half as
frequently as the mean for the university group. The
Arabic TH-variable thus appears to be a highly developed
sociolinguistic marker, an indicator which co-varies along
at least the two dimensions of style and socio-economic
class.

Something should be said here about the subjective
reactions of native speakers to the varying pronunciations
of words containing the TH-variable. Stop pronunciations
of words with etymological interdentals are universally
identified by native speakers as colloquial and therefore
"incorrect" when used in any context which normatively
calls for the use of classical Arabic. The status of
sibilant variants is much more complex and whether or not
/s,z,z̲/ are considered "correct" pronunciation of Arabic
ث , ذ , ظ depends on both the critic and a finer definition
of the speech situation (cf. Kaye, 1970). If a student
reciting from the Koran reads using sibilant pronunciations,
he will be forcefully corrected by his Arabic teacher.
However, a television newscaster who alternates between
interdental and sibilant pronunciations will occasion no
comment. His variable behavior in that context (still
formal and still normatively requiring "classical" Arabic)
will be neither censured nor even noticed.

Variability and Language Transfer

Hypotheses. In the light of the foregoing discussion,
two hypotheses are suggested regarding the pronunciation
of th-words in English by native speakers of Egyptian Arabic:

(1) Native speakers of Egyptian Arabic learning
English as a FL will alternate interdental and sibilant
(but not stop) pronunciation of th-words along the dimension
of style (formal-informal), in English as in Arabic.

(2) Within a given style level, the frequency with
which a given speaker substitutes sibilants in English
th-words will reflect his performance in Arabic at an
equivalent style level.

Subjects and procedure. Subjects for the present experiment consisted of 34 native speakers of Arabic, all male, all students of English at the time the study was carried out. Twenty-two of the subjects were first- and second-year students in Egyptian public (government) secondary schools. Their ages ranged between 15-17 years. In each of the four schools from which these students were drawn, Arabic is the primary language of instruction and English is the major foreign language taught. Since English instruction is begun at the preparatory (junior high) level in Egypt, each of these S's had already completed three or four years of study of English at the time of the study. The remaining twelve S's were adult learners (24-40 years) enrolled in beginning and lower intermediate level English classes at the Division of Public Service of the American University in Cairo. These S's comprised a socially and educationally more heterogeneous group than the secondary students, but were judged by teachers familiar with both groups to be roughly equivalent to the secondary students in terms of overall English proficiency.

Each S was interviewed separately, on school grounds, by his regular English teacher and was asked to read aloud the following:

a)   a reading passage of about 150 words in Arabic
b)   a reading passage of approximately the same length in English
c)   a list of 20 Arabic words all containing either /θ/ or /ð/
d)   a list of 10 minimal pairs in Arabic contrasting /θ/:/s/ and /ð/:/z/
e)   a list of 20 English words all containing either /θ/ or /ð/
f)   a list of 10 English minimal pairs for /θ/:/s/ and /ð/:/z/

The reading passages in both English and Arabic were chosen on the basis of appropriateness of level for the student subjects. Natural texts were altered slightly (a) to increase the occurrences of /θ/ and /ð/ and (b) to reduce excessive repetition of a few specific lexical items with these fricatives in English (e.g. the, there) and Arabic (e.g. /ha:ða/, 'this'). The Arabic reading passage had a total of ten potential occurrences of /θ/ (10 types, 10 tokens) and thirteen potential occurrences of /ð/ (10 types, 13 tokens). The English passage had a total of twelve potential occurrences of /θ/ (11 types, 12 tokens) and eighteen potential occurrences of /ð/ (11 types, 18 tokens). As far as possible the test materials were constructed using words that the teachers judged to be familiar to the students.

S's were told that their teachers wanted to compare
their reading levels in Arabic and English. They were of
course not told about the particular phonological contrast
of interest, but since the presentation of the first minimal
pair list was assumed (and intended) to make the students
aware of this specific interest, no word lists were presented
to the subjects until both reading passages were completed.
Within the two major groups of tasks, reading passages and
word lists (including minimal pairs), the order of presentation
(Arabic-English or English-Arabic) was randomly varied.

All S's were tape-recorded while reading. From these
tapes, scores were computed initially for the number of
instances of /θ/ and /ð/ separately in each of the three
parts of the test for each of the two languages. Subsequent
analysis showed no significant differences on the voiced-
voiceless dimension, so only figures for /θ/ and /ð/ summed
are presented in the following section. Realizations of
classical Arabic /ʃ/ were not observed in this study. The
frequency of this phoneme in Arabic is low, and since
there is no English counterpart of this Arabic segment
there is no place in English where one could look to find
interference from the Arabic alternations.

Since the number of occurrences of the TH-variable
in the English reading passage was greater than the number
of such occurrences in the Arabic reading passage, percentage
scores were used for this analysis. For the word lists and
minimal pairs lists only raw scores were used.

(Salah Abdel Khalek Gawad, Abdel Mottaleb Abdel Aaty,
Abbas Mohamed Shalaby, and Mona Zaklama Fahmy, students in
TEFL 503 (Psychological factors in language learning) at
the American University in Cairo, assisted in the design,
administration and scoring of the experimental materials
used in this study.)

Results and Discussion. In the English test battery,
four S's pronounced all th-words correctly, using /θ,ð/
in every case. One of these S's used /θ,ð/ consistently in
the Arabic part of the test as well. One S produced only
sibilant pronunciations in both languages. All other S's
alternated between /θ,ð/ and /s,z/ in both English and Arabic.
As expected, there were no occurrences of /t,d/ pronunciations
in either language, with the single exception of one S who
read /talatiːn/ ('thirty') rather than the expected /θalaθiːn
or /salasiːn/ in the Arabic reading passage.

The hypothesis that S's would vary their pronunciations
of th-words stylistically in the two languages was confirmed,
although the patterns found were not identical. As can be
seen from Table 2, S's increased the frequency of th-
pronunciations in both languages when moving from the most
informal style used here, the reading passage, to the two
more formal styles of word lists and minimal pairs.

Table 2: Realizations of the TH-variable in English
          and Arabic - All Subjects

		Reading Passage	Word List	Minimal Pairs
% of interdental pronunciations	Arabic	33%	64%	77%
	English	54%	73%	73%

In Arabic, S's increased the frequency of interdental
pronunciations gradually in successively more formal reading
styles. For Arabic, the differences when moving from the
reading passage to the word list and when moving from the
word list to the list of minimal pairs are both statistically
significant (by t-test, significant at the 1% level of
confidence). However, it is apparent from the table that
the English test did not elicit completely parallel behavior.
The increase from reading passage to word list is less in
English than in Arabic (though still significant at the 1%
level), and there was no increase at all when moving from
reading word lists to reading minimal pairs in English.

At least two facts need to be explained here: the
higher base point (reading passage) for English than for
Arabic, and the absence of measurable differences in
performance in word lists as opposed to minimal pairs.
In the first case, there are at least two possibilities.
The English reading passage might not have been sufficiently
equivalent to the Arabic passage to get comparable results,
or some or all of the S's may actually perform less
variably in English than in Arabic, though still not in
control of a categorical interdental-sibilant contrast.
The latter seems the more plausible explanation and is
discussed further at the end of this section.

The lack of increase in th-pronunciations when reading
minimal pairs, on the other hand, may well be the result of
the instrument used. As noted above, the English test was
constructed attempting to use only words familiar to the
students. For the reading passage and word list this was
possible, but   familiarity could not be ensured for the
minimal pairs list. Minimal pairs such as then:Zen, the
latter almost certainly unfamiliar to S's, were eliminated
from consideration, but some items included, such as

seething:seizing or breeze:breathe (the latter pronounced
by several S's as /breə/ an incorrect pronunciation
scored as correct in this case, since only the interdental-
sibilant alternation was at issue) proved also to be
unfamiliar. It is suspected that the effectiveness of
minimal pairs testing as a device to draw attention strongly
to the contrasts being tested was neutralized in this case
by the attention focused by S's on the meanings of unfamiliar
lexical items.

The hypothesis that, within a given style level, the
frequency with which a given S would substitute sibilants
for interdentals in English th-words would reflect his
alternations in Arabic was strongly supported. As can be
seen from Table 3. performance scores for English th-words
correlated highly with scores on the Arabic TH-variable
for both subject groups at each style level measured.

While the correlations reported in Table 3 permit
rejection at a high level of confidence of the null
hypothesis that pronunciation of English th-words is not
related to performance on the Arabic TH-variable, such
correlations do not, strictly speaking, prove a causal
relationship, i.e. language transfer from Arabic to English.
The theoretical possibility that English performance
has caused the Arabic performance is in the present case
highly implausible. The third possible interpretation,
that some unmeasured variable lies behind both the Arabic
and the English interdental-sibilant alternations, is not
implausible, however, since as reported earlier performance
on the Arabic TH-variable was shown in a previous study to
be a function of socio-economic class and education.

Table 3: Pearson Product-Moment Correlations for
English and Arabic TH-variable in Various Styles

r (correlation coefficient) for:	12 Adults	22 Secondary Students	Total All S's
Reading passages	.6977*	.7913**	.7348**
Word lists	.6863*	.6968**	.6897**
Minimal pairs	.7225**	.6952**	.7015**
Total battery	.7687**	.8436**	.8499**

* p < .01
** p < .005
(one-tailed)

The present experiment was not designed to include detailed information on the socio-economic status of S's. However, several ex post facto analyses have been performed on the data to discover possible differences among subject groups.

It was suspected that there might well be measurable differences between the secondary students and the adult learners used as S's. These two subject groups differ in several ways, including age, educational experience, exposure to different teaching methods, materials and teacher-models. However, t-tests carried out on the means of these two groups at each style level revealed no significant differences in either English or Arabic.

A closer examination of the secondary students, on the other hand, indicated that these S's could be broken into two groups which exhibited quite different behavior. Of the 22 secondary S's, six were drawn from a terminal secondary school program which trains elementary school teachers for public schools. By reputation at least, such teacher training schools **enroll students of lower socio-economic background and offer poorer quality instruction** than do the full-curriculum college preparatory secondary schools. The remaining 16 secondary S's were students in regular, non-terminal secondary schools and are at least potentially future university students.

As shown in Table 4, there were striking differences between these two groups of secondary students. In all six test contexts, the means for the non-terminal secondary S's are higher than those of the terminal secondary S's. In spite of the fact that the number of S's in the terminal group is very small, differences in the means for the reading passage and word lists in both languages were significant at the 5% level of confidence or better.

Something might be said also about the performance of these two groups with regard to the minimal pairs list, particularly in English. It was speculated above that the identical means for all S's (secondary and adult combined) for the English minimal pairs list might have been due to the inclusion of unfamiliar words which distracted S's from the phonological contrasts at issue. From Table 4, we see that the two secondary groups behaved quite differently in this regard; the terminal secondary S's did tend to increase the frequencies of interdental pronunciations of English th-words when reading minimal pairs, while the non-terminal students tended to decrease interdental pronunciation. This suggests the further speculation (no more than that) that the university preparatory students were more distracted by and concerned about the meanings of unfamiliar words, while the terminal students were able to concentrate on simply reading aloud in as acceptable a manner as possible, with little regard for meaning.

Table 4: Mean Scores for the TH-variable in English and Arabic for Two Groups of Secondary Students.

		6 S's Terminal secondary	16 S's Non-terminal secondary	t-value
Arabic	Reading passage	8.66	45.63	2.369*
	Word list	43.33	70.62	1.747*
	Minimal pairs	68.33	78.75	.704
English	Reading passage	19.66	60.25	3.243**
	Word list	40.00	86.25	5.087**
	Minimal pairs	53.33	79.38	1.615

df=20
*p < .05
**p < .01
(one-tailed)

One final aspect of the data collected in the present experiment might be discussed, not because firm conclusions can be drawn but because of the importance of questions which need to be answered by future research. One needs to ask how it is that the kind of phonological interference from native language to FL demonstrated here for relatively low proficiency FL learners persists for some very advanced second language speakers, while other such learners quite successfully develop disjunctive phonolgies for the two languages. The data here may offer no answers in terms of the strategies that such successful learners use, but do provide evidence that some of the S's in this experiment are moving in that direction. A comparison of individual subject scores for the total English battery versus the total Arabic battery reveals no S whose total score (interdental realizations of the TH-variable) in Arabic exceeds his English scores by as much as ten percentage points. On the other hand, six of the twelve adult S's and six of the 16 non-terminal secondary S's (but none of the terminal secondary S's) did have total English th-scores exceeding their Arabic scores by ten or more percentage points. While continuing to exhibit th-variability in both languages and continuing to express this variability along the dimension

of style, these S's are apparently moving towards a
categorical system for English. Two S's, both non-terminal
secondary students, appear to have almost achieved the goal
of disjunctive phonologies for the two languages: the
total English interdental scores for those students were
90% and 88%; their total Arabic th-scores were 51% and 19%,
respectively.

Conclusions

The study reported here has investigated a very limited
area of interlanguage phonology in order to support the claim
that a careful, sociolinguistically oriented, contrastive
analysis can predict some FL errors, i.e. that a better case
can be made for language transfer than for explanations
independent of native language. The data support the
following conclusions with regard to the specific phonological
variable investigated:

1.   The common observation that native speakers of
Egyptian Arabic frequently substitute sibilants in English
th-words, regardless of whether or not they have been
exposed to classical Arabic, was confirmed. The explanation
offered is that the traditional dichotomy between classical
and colloquial Arabic is misleading in this respect, and
alternation among interdental and sibilant pronunciations of
Arabic th-words is normal and acceptable in most speech
contexts which normatively require "classical" Arabic.

2.   The observation that Egyptians do not substitute
stops in English th-words was also confirmed. The explanation
offered here is that while colloquial stops do often alternate
with classical interdentals, this is the result of an
historical sound change which is no longer productive.

3.   The hypothesis that S's would alternate inter-
dental and sibilant pronunciations of the TH-variable
stylistically in the two languages was confirmed. However,
an English minimal pairs list did not elicit the expected
increase in standard interdental pronunciations. It was
suggested that this unexpected result might have been due
to the inclusion of unfamiliar words in the English minimal
pairs list, which may have distracted some (but not all) S's
from the phonological contrast at issue.

4.   The hypothesis that, within styles and across the
stylistic spectrum, S's substitutions of sibilants for
interdentals in English would correlate highly with their
performance in Arabic was supported.

5. Previous research showing that performance on the Arabic TH-variable is an indicator of social class and educational background was at least partially supported by the differences in performance in the two languages by terminal and non-terminal secondary students.

Besides predicting the occurrence and distribution of second language errors in pronunciation in a more precise manner than conventional analyses contrasting native and target languages as static systems, the present investigation may have something to say about the relative persistence of phonological interference in even advanced second language learners. The patterning of the Arabic TH-variable has a number of properties which allow it to be classified as a "stable sociolinguistic variable" (Labov, 1970). Labov has suggested that one of the striking characteristics of such stable sociolinguistic variables is that while there is general awareness that one variant is "correct", individual members of the speech community are not aware that they shift in the way they do, nor do they know that others shift in the same manner. This is certainly true in the present case. An educated native speaker of Egyptian Arabic is typically skeptical when told that literate native speakers often substitute /s, z/ for /θ, ð/ when reading Arabic, and incensed if told that he himself makes such substitutions. These substitutions are made well below the level of conscious awareness.

There is finally at least one implication for teaching English to native speakers of Egyptian Arabic. A rather common device used by teachers of English who are themselves native speakers of Arabic is to stress the identity of English th with orthographic Arabic ث (θ) and ذ (ð), rather than س (s) or ز (z). In the light of the present analysis, this seems misguided. For although there are minimal pairs showing that Arabic /θ, ð/ and /s, z/ are phonemically contrastive in careful speech, the fact remains that any printed ث may be read aloud as /s/ and any ذ as /z/. Identification of English th with the Arabic variable th is precisely what must be avoided.

16

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17

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