

INTRODUCTION

Abstract

It has been suggested that it may be easier and more economical to mix languages, i.e., code switch, than to keep them separate in certain contexts (e.g., Rodriguez-Fornells et al., 2012). Exploring switch costs in different bilingual contexts is thus essential (Heredia et al., 2001; Green, 2011). This study investigates the switch costs in Algerian Arabic-French bilinguals who frequently code-switch using contexts in which code switching (CS) is typical or not.

Previous studies:

- CS incurs switch costs, that is, slower RTs for switches than non-switches (e.g. Green, 1998; Gollan & Ferreira, 2009).
- Faster RTs for target words embedded in context that provides more semantic clues (e.g., Altarriba et al., 1996)
- Naming cognates was usually faster than non-cognate controls.
- Cognate effect was eliminated in high-constraint but not in low-constraint sentences in Schwartz et al., (2006), but was persistent in Van Assche et al., (2010) in both high and low contexts.
- Cognates may facilitate and trigger switching from one language to the other (e.g., Broersma et al., 2009).
- High frequency Spanish switches produced slower naming times and longer fixation times when they appeared in high constraint sentences but not in low constraint context. Altarriba et al. (1996)

Current Study

We examined the processing of code switching in Algerian bilinguals who frequently code switch between Algerian Arabic and French but not between Standard Arabic and French. In particular we ask the following questions:

- Are switch costs dependent on the semantic constraints of the preceding sentence context, leading to the expectancy of a particular word form?
- Are switch costs dependent on the daily frequency of switching between certain language pairs compared to others?

Experiment (1) tests question (1):

Design: Switch (AA-FR, FR) x Constraint (High/Low) x Cognate (Cognate/non-cognate), see [blue rectangle](#) in (Table 1)

Predictions:

- Larger effect of constraint for cognates: naming is quicker in high than low constraining context, especially for cognates. This is because high context biases towards a word that share form and meaning.
- Reduced switch costs for cognates in high constraint: non-cognates will be slower to name after a switch than after a non-switch; switch effects are reduced in cognates. This is because semantic and partially phonological expectations are met with a cognate at the switch point.

Experiment (2) tests question (2): (Switch and non-cognates only):

Design: Base Language (AA-FR, SA-FR) x Constraint (High/Low), see [orange rectangle](#) in (table 1)

Predictions:

- Base language effect: naming will be slower after a SA-FR switch than after an AA-FR switch. This is because a switch to FR is not typically expected when listening to SA. AA-FR is the default language switching in everyday conversation.
- Constraint x Base language: naming will be faster in high than low constraining contexts after a AA-FR switch than after a SA-FR switch. This is because of the context cues biases in the high cloze and the weak expectations for FR continuation after SA base than after AA base language.

METHOD

Participants

- 68 students participated in Experiment 1 and 65 in Experiment 2. (School of Computer Science, School of polytechnic.in Algiers)
- live in Algiers since birth or since early age (5).
- Speak Algerian Arabic / Berber. As mother tongue, Standard Arabic (school language) since 5/6 French since 8 or earlier.
- 18-25 years old
- Code switch regularly (ACES questionnaire, (Blackburn et al., 2011))

Materials

Experiment 1

- 32 cognate and 32 non-cognate FR target words embedded in high/Low cloze AA and FR sentences ,
- 128 fillers, 1/2 contain different switch points, and 1/2 are non-switch sentences (heard only).

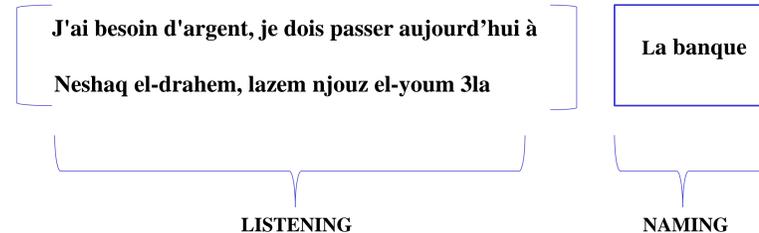
Experiment 2

- 32 non-cognate FR target words embedded in high/Low cloze AA and SA sentences.
- 64 fillers, 1/2 contain different switch points, and 1/2 are non-switch AA and SA sentences

Table 1: Stimuli and conditions

Condition	Cognate	Non-Cognate
(1)LowCloze-FR	Nous allons voir un ami, ensuite nous passerons à <u>la banque</u> . "We will see a friend, and then we will go to <u>the bank</u> ."	Ce garçon, bien qu'il soit très jeune, sait utiliser <u>le couteau</u> . "This boy is so tiny and yet he knows how to use <u>the knife</u> ."
(2)HighCloze-FR	J'ai besoin d'argent, je dois passer aujourd'hui à <u>la banque</u> . "I need money, I have to go today to <u>the bank</u> ."	Alors que j'épluchais les pommes de terre je me suis coupée le doigt avec <u>le couteau</u> . "When I peeled the potatoes I cut my finger with <u>the knife</u> ."
(3)LowCloze-AA-FR	rana rajhin n'ufu s'ahbi, min ba'd ndzuzu 3la <u>la banque</u> . "We will see a friend, and then we will go to <u>the bank</u> ."	had lewled jhal syir u ja'sref jesta'smel <u>le couteau</u> . "This boy is so tiny and yet he knows how to use <u>the knife</u> ."
(4)HighCloze-AA-FR	neshaq ad-drahem, lazem ndguz el-yuum 3la <u>la banque</u> . "I need money, I have to go today to <u>the bank</u> ."	ki kunt nqafar fi lbat'a'a qat'a'st s'ab'si bi- <u>le couteau</u> . "When I peeled the potatoes I cut my fingers with <u>the knife</u> ."
(5) Highcloze (SA-FR) unexpected language	Experiment 1	3indama kuntu ?uqafiru el bat'a'a qat'a'stu ?us'bu'si bi- <u>le couteau</u> . "When I peeled the potatoes I cut my fingers with <u>the knife</u> ."
(6) Lowcloze (SA-FR) unexpected language	Experiment 2	haða el s'abi s'ayir lakinahu juhsinu ?istixdam <u>le couteau</u> . "This boy is so tiny and yet he knows how to use <u>the knife</u> ."

Procedure



Reaction times (RTs) to target noun phrases are recorded by means of a voice trigger. Analysis is conducted on correct, fluent responses only.

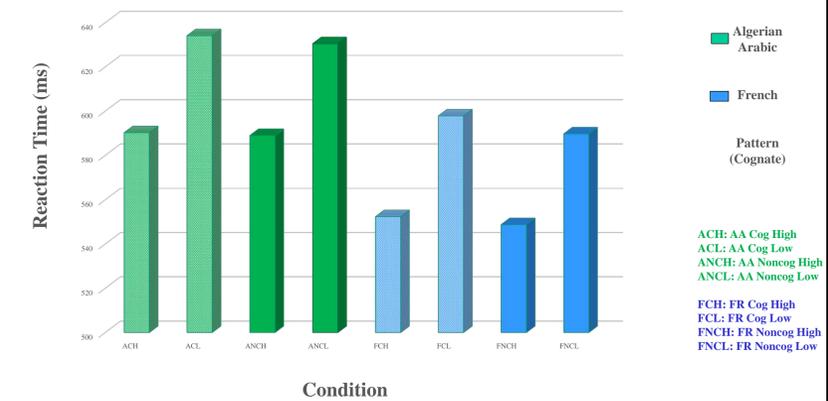
Results

RTs to the French NPs were analyzed using a linear mixed effects model in R.

- In both experiments, the only significant effect was that of Cloze.
 - Exp1: $p < .001$
 - Exp2: $p < .05$
- RTs in the High cloze sentences were faster than RTs in the Low cloze sentences: participants anticipated the forthcoming words when context provides more semantic clues.
- No cognate effect significance: though, RTs to cognates were **slower** than to non cognates.
 - Means:** Cognate = 591.9867 ms Non cognate = 588.1671
- No base language effect
- No interactions

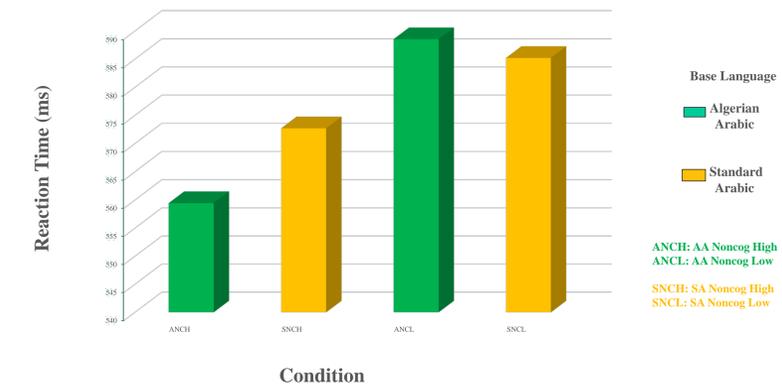
Mean RT to French noun phrases in FR and AA-FR Context

Experiment 1



Mean RT to French noun phrases in AA/SA Context

Experiment 2



DISCUSSION AND CONCLUSION

Preliminary results show faster response times in high compared to low constrained contexts in both experiments, but no effect of switching.

In contrast to previous studies (Schwartz et al., 2006; Van Assche et al., 2010), response times to cognates are slightly longer than to non-cognates in both high and low contexts.

In contrast to our prediction, no base-language effect was found in experiment 2.

A tentative explanation of the results is that regular and habitual code switching may have shaped language processing in Algerian bilinguals, in a way that rendered them flexible and ready to switch regardless of the base language. The absence of switching effect also suggests that switching may not always incur additional processing load.

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