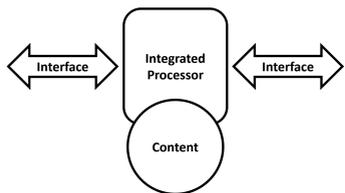# Accounting For Intra-word Codeswitching In a MOGUL Framework

Cognitive Framework: MOGUL

In MOGUL, Codeswitching is a natural product of the real-time language representation and processing perspective
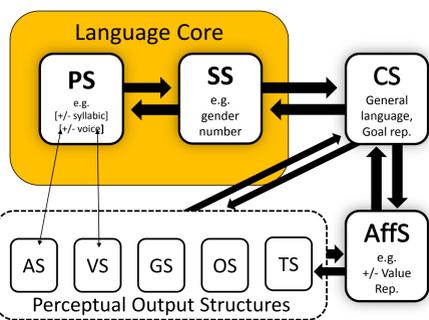
A Module in MOGUL
- All modules have the same basic architecture
- Content = module specific primitive features stored in Long-term memory
- Integrated processors manipulate activation levels of primitive features
- Interface processors co-index (chain) active features/ feature bundles between modules

Modular Architecture: Jackendoff (1997)
- Language Core:
  - Syntactic Structures (SS)
  - Phonological Structures (PS)

- Extra-Linguistic Modules:
  - Conceptual Structures (CS)
    - Locus of language selection
    - Contains both semantic & pragmatic knowledge
  - Perceptual Output Structures(POpS):
    - Sensory perception
  - Affective Structures (AfS):
    - Value representations; e.g. [+ positive]

Modules form complex representations by combining module-specific primitive features into **feature bundles** which may be linked to specific languages

**Words as Representational Chains → (PS + SS + CS)**

The Lexicon in MOGUL: What is a word?
- representational chains are co-indexed representations stored in Long-term memory and are associated with a context(s)

Cognitive Framework

Conceptual Triggering: Language Selection
- specific contexts are generally associated with one language (e.g. use Lx with family and Ly at work);
- context effects the activation level of "general language representations" in CS (e.g. ENGLISH, SPANISH)
- "general language representations" increase the activation levels of associated representations in the language core (i.e. PS & SS)
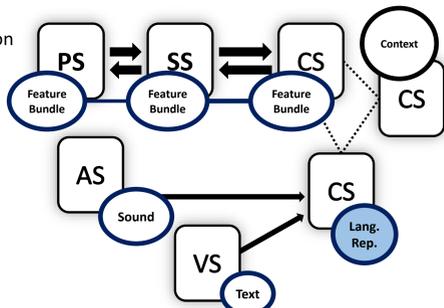
Cognitive Context: is mental model an individual creates to reflect their environment which is heavily influenced by personal experience (e.g. personal perceptions, pre-conceived opinions, etc.,) (Van Dijk, 1997)

- In MOGUL terms: context is taken as active conceptual chains and their associated activations

Conceptual Chain/Context → (CS + POpS + AffS + associations)
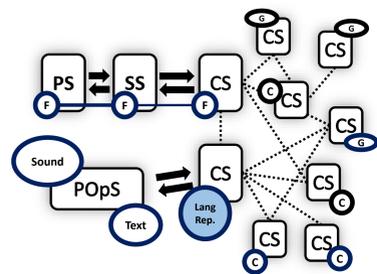
Factors which influence Cognitive Context:
- Linguistic Landscape
- Identity of the interlocutor
- Self-identity / Self-Representation
- Communicative Goal
- Value representations (AffS)

These factors play a central role in establishing a *dense-codeswitching context*
(Abutalebi & Green 2013)

Goal Representations: are extra-linguistic CS representations;
- linguistically, goal representations drive social or communicative interactions
- activation levels for various goal representation interact with cognitive context which effect language selection

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Intra-word Codeswitching

- **Codeswitching:** the mixing of two or more languages with in a single discourse. Switching may occur between sentences, phrases or words.

- **Intra-word Codeswitching:** the mixing of two languages with in a single word; switching occurs at morpheme boundaries. (Grimstad, Lohndal & Afarli, 2014)
  Intra-word Codeswitching = W[M_{Lx} + M_{Ly}]

Crucially, **codeswitched** elements maintain their original form (e.g. phonological form); unlike **lexical borrowings** (i.e. loanwords) which are mentally integrated into the host language

Leo un MAGAZINE [mæga 'ziyn] → **Codeswitching**
'I read a magazine'

Leo un magazine [maɣa 'siŋ] → **Lexical Borrowing**
'I read a magazine'

(Poplack 1980)

- Some language mixing researchers argue intra-word codeswitching is impossible (i.e. Poplack 1980, MacSwan 2014)
- However, empirical examples can be found in CANS (Corpus of American Norwegian Speech); an American Heritage community of Norwegian-English speakers show that it is possible (Alexaidou, et al. 2015)

den **field**-a   den **track**-en
that field-DEF.F   that track-DEF.M
'that field'   'that track'

- the lexical elements 'field' and 'track' are English lexical items and produced using English phonological rules but the suffix (i.e. morphology) attached to the lexical items are syntactically Norwegian
- Norwegian is considered to be the 'host language' as the English lexical items are part of a larger Norwegian phrase/sentence

Linguistic Framework

Codeswitching in Minimalism (MacSwan, 2014):
- No cross-linguistic syntactic constraints / boundaries: MacSwan's assertion
- A Null Theory → No extra machinery

Nothing constrains codeswitching apart from the requirements of the grammars involved

MacSwan's Formalization of Codeswitching: {G_x ∪ G_y}
- In MOGUL terms {(PSx ∪ PSy) + (SSx ∪ SSy) + (CSx ∪ CSy)}
- There are no universal boundaries/constraints on codeswitching

A problem with intra-word codeswitching? : **PF Disjunction Theorem**:
i) The PF component consists of rules/constraints which must be (partially) ordered/ranked with respect to each other, and these orders vary cross-linguistically;
ii) Codeswitching entails the union of at least two grammars;
iii) Ordering relations are not preserved under union;
iv) Therefore, code-switching within a PF component is not possible.
(MacSwan, 2005: p. 73)

The PF Disjunction Theorem places a prohibition on Intra-word codeswitching.

Intra-word codeswitching & Distributed Morphology: (Grimstad,Lohndal & Afarli, 2014)
- Words usually fit in sentences; this sentential frame provides the 'host language'
- The host language generates the syntactic frame/exoskeleton
- Late insertion matches lexical items from Lx to the Ly exoskeletal frame
- Morphological elements are phonologically underspecified
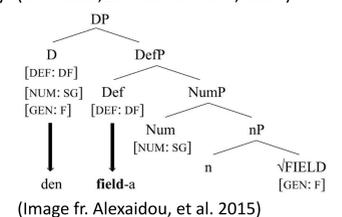
(Image fr. Alexaidou, et al. 2015)

Intra-word Codeswitching in MOGUL

This account of codeswitching is the natural consequence of representation and processing in the MOGUL framework.

- **Processing is not serial**: incremental and dynamic processing allows Lx & Ly representations to be in competition at every stage of the derivation

Derivation for ' den fielda'
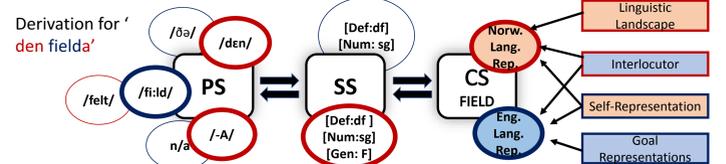
- Cognitive context oscillates between dominant languages (i.e. contexts are more/less balanced)
- This oscillation causes two language representations to become active in the CS
- The conceptual triggering of 2 language causes representational chains from each language compete against each other
- Intra-word codeswitching occurs when feature bundles from Lx are the most active in the PS but feature bundles from Ly are most active in the SS;
- the result is the construction of a new representational chain with feature bundles from both languages.

Norw. Rep. Chain = (PS + SS + CS)
English Rep Chain = (PS + SS + CS)

Codeswitch = (PS + SS (CS + CS))

MOGUL & the PF Disjunction Theorem:
- MOGUL derivations do not crash. Representational chains are formed from the most active feature bundles in each module; the PS Disjunction Theorem does not hold true in MOGUL.

This account is compatible with a Distributed Morphology approach to Codeswitching
- Intra-word codeswitching appears to be a natural consequence of DM
(Grimstad,Lohndal & Afarli, 2014)

"A Theory of code switching, should, ideally, not be a theory of code switching"
(Truscott & Sharwood-Smith, 2016)

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