1. Types of bilingualism
According to age of first exposure to the second LAN:
- simultaneous from birth (bilingual first LAN acquisition)
- child successive
- adult second LAN learning

2. Why study bilingual children?
- They are their own perfect matched pair: there are no individual, cognitive or environmental differences to take into account.
- One can reach a better understanding of the influence of input on LAN development (input to monolingual children is more homogeneous).
- One can test the effects of bilingualism on general cognition.
- One can test theories of grammatical development proposed for monolingual children.
- There is still a lot of ignorance about the facts of bilingualism, and more and more bilingual families who would benefit from informed help.

3. Main patterns of exposure
- One parent-one LAN (most common)
- Minority LAN at home, majority LAN outside
- The two LAN are used interchangeably by both parents
- Less common patterns (morning vs. afternoon, weekdays vs. weekends, etc)

4. Quantities of input may shift
- The perfectly balanced bilingual (and the perfectly balanced bilingual input) do not exist.
- The balance between the two LAN may change if the child’s situation changes.
- The dominant LAN (in the early years) is not always the LAN of the wider environment. (there’s always a LAN that is ahead (usually the one spoken in environment+schooling))

5. Code-switching vs. code mixing
- Code-switching is a pragmatic strategy employed by speakers who have a good command of two LAN; it involves a syntactic or phonological shift to the other LAN, either within-sentence or between sentences.
- Code-mixing (also called ‘borrowing’) is a grammatical phenomenon and refers to the use of elements from the LAN-not-in-use with some morphosyntactic and/or phonological adaptation to the structure of the active LAN.

5.1. The grammar
- LAN mixing/switching - when it occurs - is not a sign of linguistic confusion because:
  o adult bilinguals do it too
  o it obeys a “grammar”: children know at what point of the utterance switching can occur and what the appropriate combinations are.
- Mixing: a Spanish-English bilingual child is much more likely to say ‘La house’ than ‘The casa’ (I.e. Spanish article + English noun, rather than ‘English article + Spanish noun)

6. Other factors:
Type of input: bilingual children – are exposed to less variation than monolinguals in the minority LAN – often hear both their LAN from native speakers undergoing L1 attrition or by L2 speakers.
(Exposure to variation is important to become very good in LAN (attrition of native LAN when living in other-LAN-speaking country, e.g. Prof’s Italian changed after 20 years in UK))
7. Bilingual processing

- LAN mode (Grosjean 1998): refers to the state of activation of the bilingual’s LAN and LAN processing mechanisms.
- Bilinguals can be in a monolingual mode, or a bilingual mode, or anything in between, depending on the interlocutor, the topic, the situation, etc.

7.1. The LAN mode continuum (Grosjean 1998)

- Code-mixing and code-switching tend to occur when speakers are in bilingual mode.
- Bilinguals differ in the extent to which they travel along the continuum.
- Some cultures, situations and registers favour the adoption of a particular mode.

8. LAN differentiation

- Do bilingual children (at least initially) have differentiated linguistic systems or a unitary LAN system?
- Do the two systems interact in the course of acquisition or do they develop autonomously? (the notions of autonomy and interaction presuppose the existence of two systems).

8.1. Separation of the sound systems

- Very young bilingual babies can distinguish the sounds of the two LAN they have been exposed to.
- They do this even when the two LAN are very similar - e.g. Spanish and Catalan (Bosch & S-Galles 1997).

8.2. Other cues used by young bilingual infants

- Mouth gestures and facial expressions are also used by bilingual babies to separate their LAN.
- Bilingual babies at 8 months can distinguish the two LAN just by watching silent talking faces (Werker & Byers-Heinlein 2008).

8.3. Early views: the “Fusion” model (Volterra & Taeschner (1978)

Evidence: A list of 137 words produced by Volterra’s and Taeschner’s children at the ages of 1;10 and 1;6. 

- Data collected mainly in interactions with a German’ speaking interlocutor; no analysis of sociolinguistic context
- Reanalysis of data (Quay 1993) shows a fair number of translation equivalents

In the first stage ...the LAN development of the bilingual child seems to be like the LAN development of the monolingual child. ... In the second stage stage, the child distinguishes two different lexicons, but applies the same syntactic rules to both LAN. In the third stage the child speaks two LAN differentiated both in lexicon and syntax...”

Problems:

- Is it really the case that the bilingual child in the initial stage is essentially monolingual?
- Is the evidence based on episodic codemixing at the lexical level sufficient to reach this conclusion?
- Code-mixing is governed by pragmatic and sociolinguistic factors and are not necessarily as sign of fusion at the level of grammatical representations.
- It has been objected (cf Meisel 1989) that there is no convincing evidence for Stage 2 of the Fusion Model. On the contrary, there is evidence suggesting that children separate the two simultaneously acquired syntactic systems from early on.
8.4. A closer look at the bilingual lexicon
The milestones of lexical acquisition in bilingual and monolingual children are similar.
- Bilingual children’s rates of vocabulary acquisition generally fall within the range reported for same-age monolinguals, as long as both LAN are considered for bilinguals.
- The distribution of lexical categories (e.g., noun, verb, etc.) in the early lexicons of bilingual children is similar to that observed in monolingual children.

8.5. The principle of Mutual exclusivity in monolinguals
Children (monolinguals) assume that objects have only one name (Markman & Wachsel 1988):
- Basic level categories are often mutually exclusive (hence class inclusion – cat/animal- is hard to acquire).
- A useful heuristic to limit the problem space: once a name is learned for an object, any new name given to the object is assumed to refer to a part of it, not to the whole.

8.5.1. Mutual exclusivity: what about bilingual children?
Bilingual children’s acquisition of translation equivalents (words in each LAN that have the same referential meaning) seems to violate the principle of mutual exclusivity.

8.5.2. Translation equivalents
- Bilingual children produce translation equivalents from the time they first begin to speak (Pearson, Fernández & Oller, 1995; Deuchar & Quay, 2000; Genesee, Paradis, & Wolf, 1995; Nicoladis, 1998; Nicoladis & Genesee, 1996; Quay, 1995).
- By 8 months afterwards the percentage of translation equivalents in their two LAN jumps to around 20-25% of their total vocabulary.
- The high rate of translation equivalents suggests that bilingual children don’t observe mutual exclusivity to the same degree as monolingual children.

8.5.3. More effects of the multilingual experience
Byers-Heinlein & Werker (2009) compared monolingual, bilingual, and trilingual children around 18 months of age (i.e. the age at which ME is supposed to emerge).
- Monolingual children show show ME effects
- Bilingual children showed weaker use of ME
- Trilinguals showed NO use of ME.
- Conclusion: the use of ME is a function of the number of LAN learned: the more experience of translation equivalents, the less reliance on ME.

8.6. Parallel syntactic systems
- Evidence in Paradis & Genesee (1996) from French-English bilinguals indicates that the two grammars are acquired autonomously: inflectional properties, for example, develop separately for the two LAN.
- In particular, there is little evidence of transfer, acceleration or delay as potential manifestations of interdependence of the two LAN.
  - Transfer = the systematic incorporation of grammatical properties into one LAN from the other.
  - Acceleration = earlier emergence of certain properties in one of the bilingual’s LAN than would be the norm in monolingual acquisition.
  - Delay = slower overall rate of acquisition due to the burden of acquiring two LAN.

9. Crosslinguistic influence (Where do we find effects of one LAN on the other?)
- Crosslinguistic influence (usually from LAN A to LAN B but not vice versa) has been found at the interface between syntax and pragmatics (Müller & Hulk 2001).
- A necessary condition is a structural correspondence between the two LAN: if LAN A allows more than one option for a structure, and LAN B overlaps with one of those options, crosslinguistic influence may occur: the LAN B-type option in LAN A is favoured over the option not overlapping with LAN B.

9.1. An example of interface crosslinguistic effect
- French monolinguals go through a stage when they alternate between producing and omitting DO.
- German-French bilingual children drop objects in French for a significantly longer time than monolingual French children.
- The reason is: they receive G evidence, which allows topic-drop. This evidence feeds the F grammar.
- The German data reinforce an option already present in the children’s early grammar.
9.2. **Testing Müller & Hulk's predictions: subject pronouns**

Null subjects are syntactically licensed but their distribution is governed by discourse-pragmatic features.

**Null vs. overt subjects in Italian** [+null subject] and **English** [-null subject]:

\[ E' \text{ partito. Is gone} \]

In Italian, the option of a null or overt subject is conditioned by the [topic-shift] and the [focus] feature.

\[ \text{Giannii ha salutato Pietrok quando pro} / \text{he him saw} \]

\[ \text{Gianni has greeted Pietro when he saw him.} \]

**Two possible predictions**
- English-Italian bilingual children drop more subject pronouns in English because of exposure to Italian.
- English-Italian bilingual children **drop fewer subjects in Italian** because of exposure to English.
- Do they lack **grammatical** knowledge?
- Do they lack **pragmatic** knowledge?

**But pragmatic knowledge is not acquired late…**
- Pragmatic knowledge is not delayed (see early sensitivity to topic encoding in child French (De Cat’s 2004 data).
- Children acquiring null-subject LAN show early sensitivity to the pragmatics of argument realization: overt arguments are more likely to be associated with informative than with uninformative features.

9.3. **Serratrice et al 2004: examples of uninformative overt subjects**

- No influence of Italian on null subjects in English: Carlo’s production of null subjects at all stages falls below the monolingual range. Carlo uses significantly more overt subjects in Italian than monolingual children.
- There seems to be influence from **English to Italian**, despite the fact that Italian is dominant throughout the period of data collection.

9.4. **Subject pronouns in other children: a consistent pattern**

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<tr>
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</table>

- Why do bilingual children use more ‘redundant’ overt pronouns?
- Is it just because they are exposed to English – a less complex LAN?
- If so, we wouldn’t expect to find this phenomenon in bilingual children who speak **2 null subject LAN**.

9.4.1. **Testing crosslinguistic effects**

- Sorace et al. 2009 compared two groups of **Italian-English** bilingual children and **Italian-Spanish** bilingual children (and monolingual controls) in a judgment task.

**Potential crosslinguistic effects and ‘complexity’:**

If bilingualism leads to a crosslinguistic effect of the less complex LAN on the more complex LAN, we would predict for subject pronouns:
- **E -> I** in I-E bilinguals (“Paoloi va a casa perché lui è stanco” *Paolo goes home because he is tired*)
- **no effects** in I-S bilinguals
Results: no effect of LAN combination
Both I-E and I-S bilinguals accept overt subject pronouns in [-TS] null subject pronoun contexts (Paperinoi ha detto che lui è caduto ‘Donald Ducki said that he fell’).

Overt pronouns as a default form
- Younger monolingual Italian children also accept a significant proportion of ‘redundant’ overt pronouns.
- Overt pronouns may be a default option used to compensate for insufficient processing resources.
- These results suggest that crosslinguistic effects are not the only cause of this phenomenon.
- Crosslinguistic influence and processing may be combined for syntax-pragmatics interface structures.

10. Effects of bilingualism on general cognition
Growing up with two LAN affects the child’s general cognitive abilities in specific ways.

10.1. Knowledge about LAN
- Bilinguals have higher metalinguistic awareness (of sounds, words and sentences).
- Bilinguals tend to be earlier readers.
- Bilinguals are better at picking up other LAN than their monolingual peers.

10.2. Awareness of other people’s points of view
Bilingual children understand at an earlier age that other people may have a different perspective from their own. This seems to be related to the experience of selecting a LAN on the basis of the perceived LAN of the interlocutor.

10.3. Attention and executive control
Bilinguals tend to be better than monolinguals at:
- switching between tasks that require attention
- focusing attention while ignoring distracting information.
These differences persist throughout life: they are found both in bilingual children and in adults who were raised bilingual from early childhood.

Because... The two LAN of bilinguals are always active.
- Bilinguals have to ‘filter out’ one LAN when they speak the other.
- They have massive practice of using a control mechanism that allows them to limit interference between their LAN.
- The same mechanism may be used in other activities that require attention and control.

Some questions for research
- Does age of first exposure IN CHILDHOOD matter? Does it matter only for particular linguistic structures?
- What is the relative importance of grammatical knowledge vs. processing abilities for structures involving contextual factors in bilingualism?
- Effects of bilingualism on general cognition: do they depend on number of LAN? on LAN similarity vs. difference? on age of onset?