

Bilingualism and intellectual developmental disorders: heresy, utopia, or possible reality

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Coming from a pessimistic view

Starting point



Lack of research involving bilingual or multilingual children with intellectual developmental disorders



Due to this lack of knowledge

Many professionals advise families to restrict input to a single language



Why ?

Because there are delays even when only one language is learned
→ precautionary principle

The origin of this pessimistic view



Cumulative effects hypothesis



Children with developmental language and communication disorders will experience disadvantages compared with monolingual peers

Developmental language Disorders

- Because of deficits of perceptual cognitive mechanisms, dual input will overwhelm them and cause problems in updating linguistic input and representations

Down's syndrome

- Because of a moderate to profound IDD and deficit in verbal memory, a dual language input will exceed their language processing and learning capacities

Autism Spectrum Disorder

- Deficit in social communication will limit social interactions and henceforth language input
- The pragmatics of communication can be altered, leading to erroneous choices and the risk of code-mixing.

Overcoming the pessimistic view



Increasing evidence that second language acquisition is not at the expense of the first language whatever the population (Paradis et al., 2021)



more specifically in Down's syndrome ? Some group studies

Same levels of dominant language abilities across linguistic domains than monolingual DS (Kay-Raining Bird et al., 2005)

Greater growth in receptive and expressive lexical skills in the dominant language than in their non-dominant language (Trudeau et al. 2011)

Equivalent word-learning skills to monolinguals on a task involving the use of syntactic cues to discover if a novel word is a noun or a verb (Cleave et al., 2014)

Same level of functional language skills (morphosyntax and vocabulary) in bilingual and monolingual DS (Felmate & Kay-Raining Bird, 2008)

The amount of exposure in a second language does not negatively impact the language abilities in the first language (Ward & Sanoudaki, 2023)



02

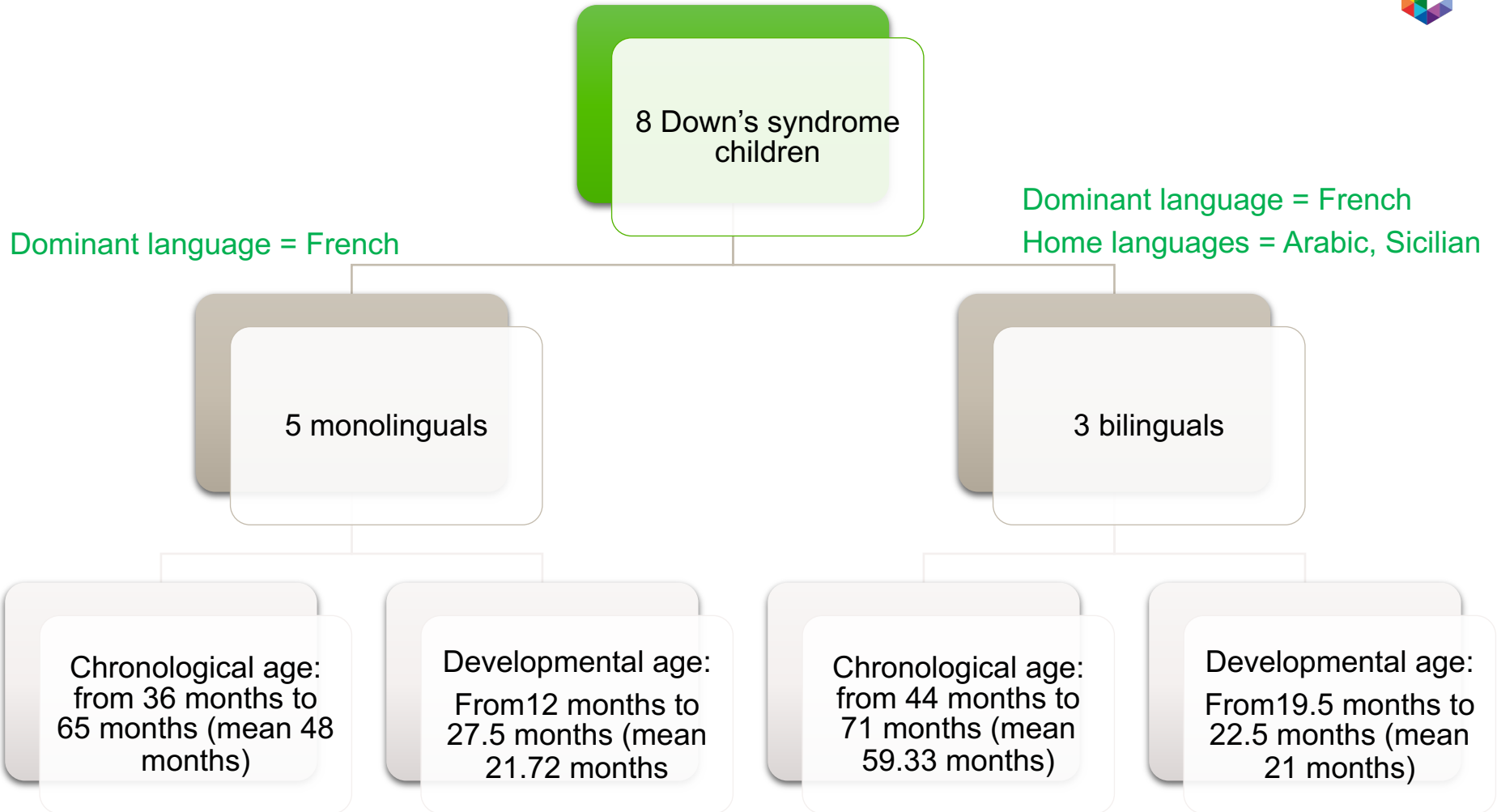
Early communicative behaviors in Down's syndrome : using gaze and pointing in Down's syndrome

C. Leroy (2018) – Language, Disabilities and neurodevelopmental disorder's Unit
Master's thesis (supervision A. Comblain)



Goals and hypothesis

- Assess the non-verbal communication skills of bilingual Down's syndrome children
- Compare them to those of monolingual Down's syndrome children and neuro-typical children matched on the chronological age.
- **Hypothesis :**
 - Bilingual Down's syndrome children will have better abilities to interpret non-verbal communicative gestures than monolingual Down's syndrome children.
 - Bilingual Down's syndrome children will have better abilities to interpret and use gaze in a communicative interaction especially when the situation is ambiguous.



Task 1 – Hidden objects

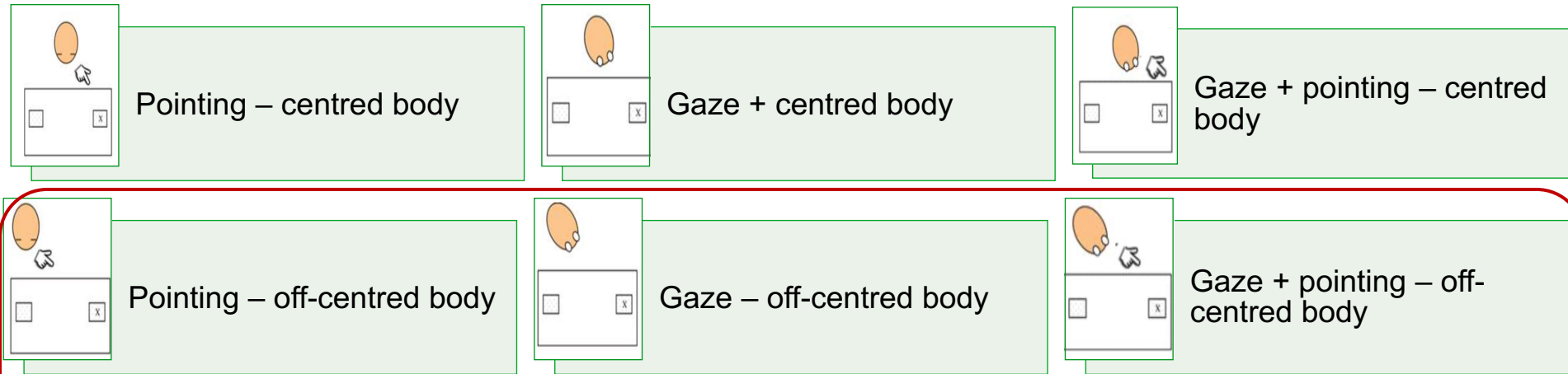


Assess the child's understanding of pointing and gaze direction (Adapted from Povinelli et al., 2016)

Material: three pairs of different opaque boxes, an attractive separation screen, magnetised wooden fish.

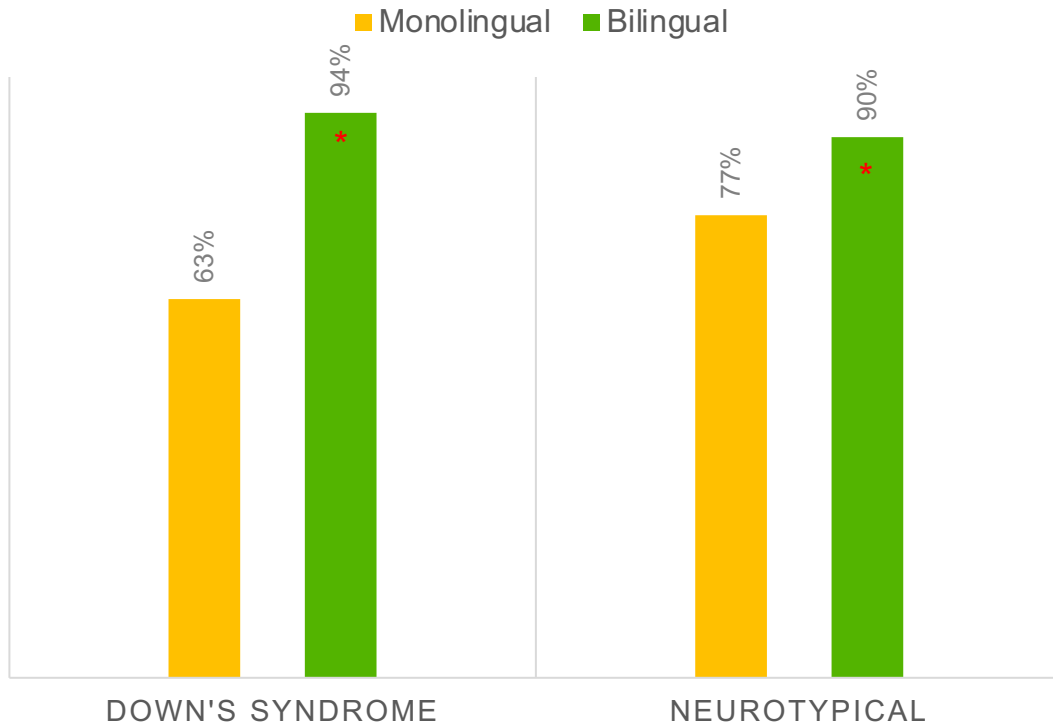
The boxes' lids are easy to handle and fitted with cushions to muffle the noise when the fish are placed in them.

6 conditions :



Ambiguous situations

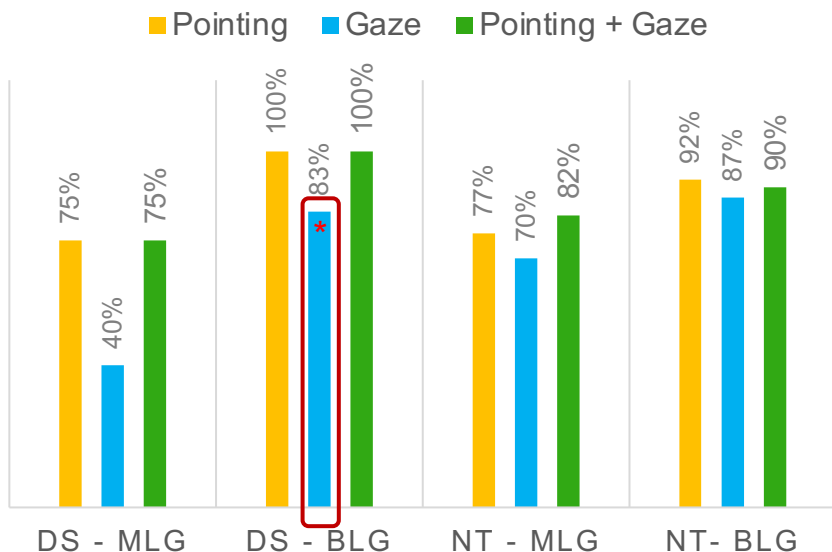
Gobal results



Percentage of total correct answers

- Down's syndrome = neurotypical (same mean chronological age : 53.5 months)
- Bilingual > Monolingual in both groups

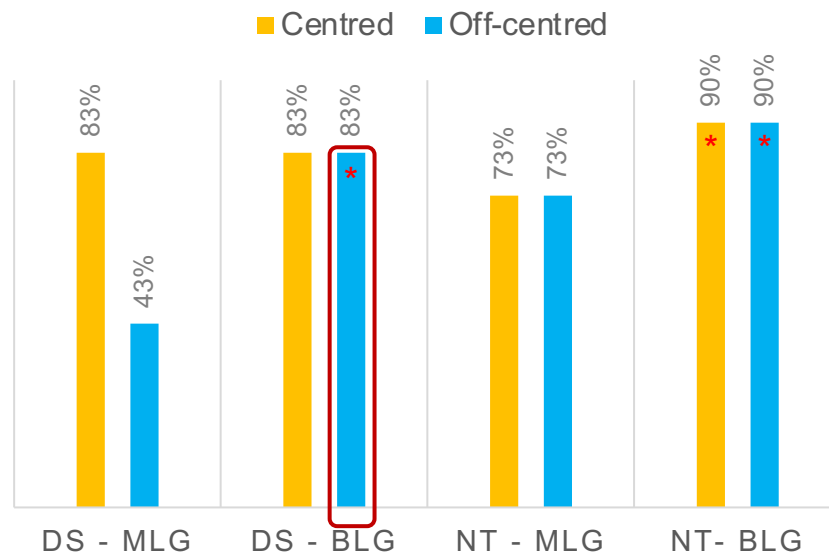
Detailed results



Percentage of correct answers for gaze and pointing conditions

- Bilingual DS > Monolingual DS in the gaze condition

→ Bilingual DS participants perform above the chance level for the condition involving the use of gaze alone



Percentage of correct answers for centred and off-centred conditions

- Bilingual NT > Monolingual NT in both conditions
- Bilingual DS > Monolingual DS in the off-centred condition

→ Bilingual DS participants perform above the chance level for the off-centred (ambiguous) condition

Task 2 – Semi-structured play

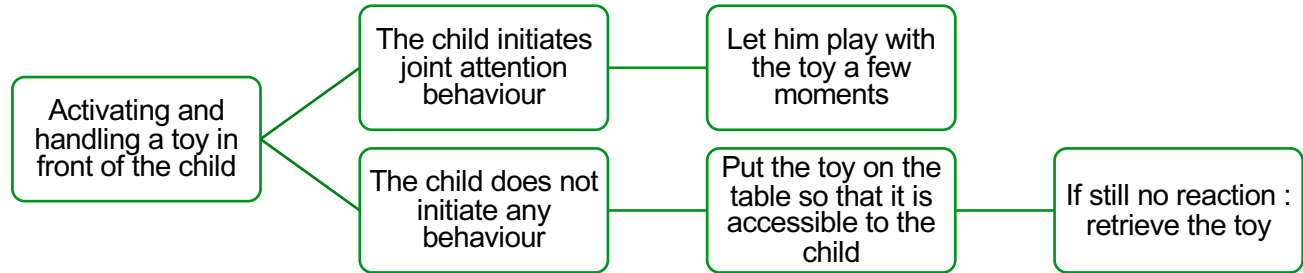
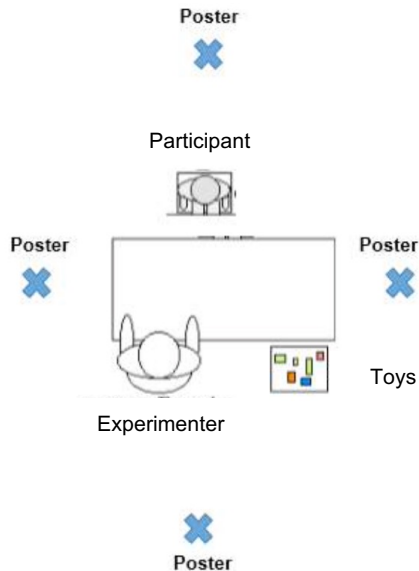


Assess the child's production and understanding non-verbal behaviors in a 'semi-structured' play situation

Adepted from Early Social Communication Scales (Mundy et al., 2003, 2013)

Material : several attractive toys such as a book, a ball, a car, a balloon, a musical box, a mechanical ladybird, a jumping frog, two puppets, a vibrating plush toy, four attractive and colourful posters, a cap, a hairbrush, glasses and a transparent box with a padlock.

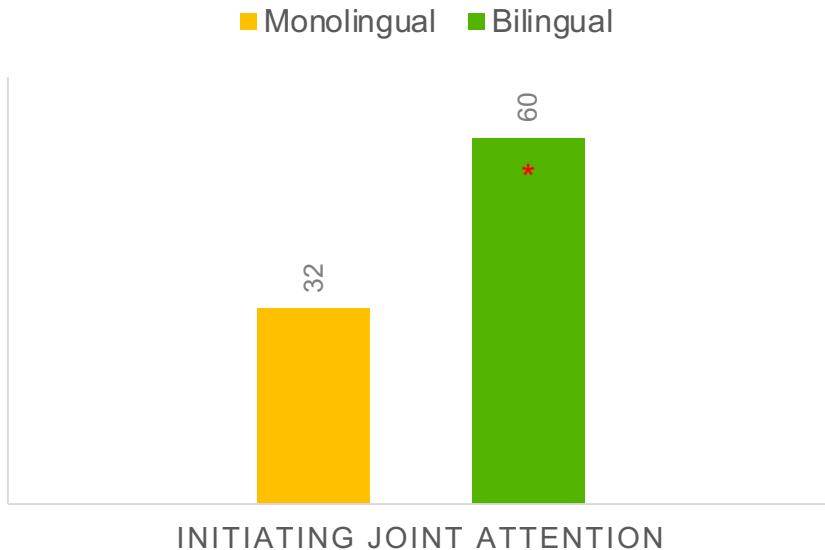
Example of an action and stimulation scenario



Variables observed:

- joint attention initiated by the child / in response to the experimenter
- Non verbal requests initiated by the child / in response to the experimenter

Joint attention – main observations



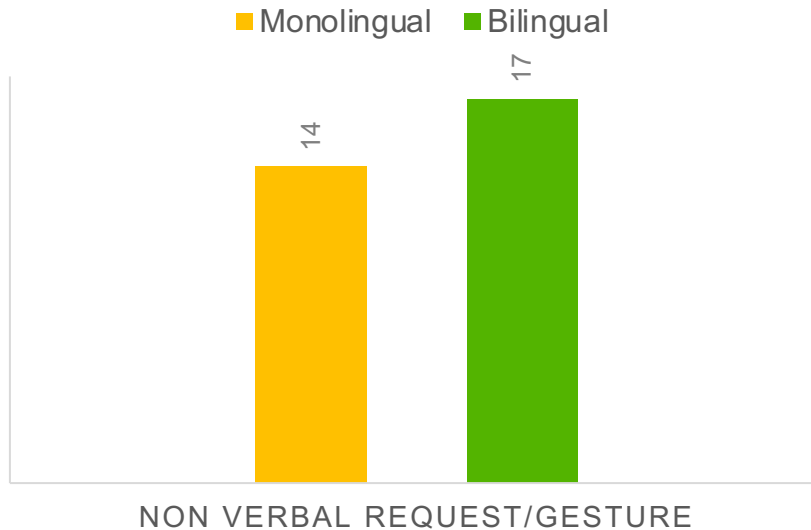
- Higher frequency of gaze use and alternation in bilingual DS participants
- Bilingual participants make greater use of alternating gaze to draw the experimenter's attention to a particular toy or event

More precisely

If monolingual participants produce more declarative pointing gestures, these gestures are less often accompanied by gaze towards the experimenter

→ bilingual participants use gaze alternation to make sure that the experimenter is looking to the same toy or event = **more mature joint attention behavior**

Nonverbal request – main observations



All participants use the **reaching** gesture at least once
→ mainly when the toy he is playing with is taken back by the experimenter or when he wants to obtain a toy out of reach

All participants use the **imperative pointing** to obtain a toy

→ bilingual participants use it more often in conjunction with verbal production (name of desired object)

Conclusion



Bilingual Down's syndrome children are **better in interpreting gaze** which is a more subtle communication cue to interpret than monolinguals.

Bilingual Down's syndrome children **more frequently use gaze towards the experimenter and alternation of gaze** than monolinguals to attract attention or to carry out communicative exchanges.

Bilingual Down's syndrome children have **less difficulty with off-centred (ambiguous) conditions** than monolinguals

- Like bilingual neurotypical children, bilingual DS develop strategies to cope with the challenges they are frequently exposed to in a bilingual context (Yow & Markman, 2016).

Bilingual Down's syndrome children **better understand non-verbal gestures** than monolinguals

- These advantages are similar to those obtained by neurotypical children (Yow & Markman, 2011)

Bilingual Down's syndrome children **use pointing combined with gaze more often in a communicative act** than monolinguals who use pointing alone

Bilingual Down's syndrome children seem to be able to increase their sensitivity to the non-verbal cues present during communication thanks to their daily experience of exposure to several languages.



03

The influence of pictorial context on lexical learning in people with Down's syndrome

S. Trippaerts (2019) – Language, Disabilities and neurodevelopmental disorder's Unit
Master's thesis (supervision A. Comblain)



8 Down's syndrome children

Dominant language = French

Dominant language = French
Home languages = Arabic

5 monolinguals

3 bilinguals

Chronological age: from 11;3 years to 23;8 years

Raven score: from 12 to 27 (mean : 18)

Chronological age: from 14;9 years to 50;10 years

Raven score: 12 to 17 (mean: 15)

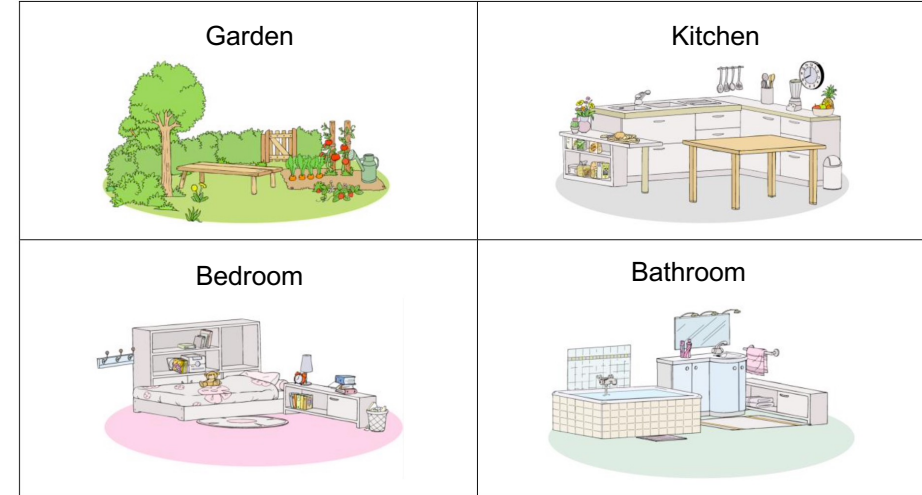
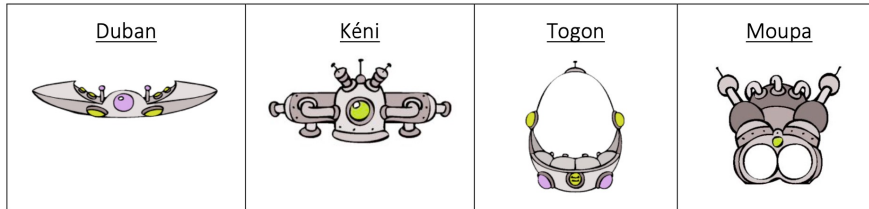


Goals and hypothesis

- Evaluating pictorial context dependence in a lexical learning task in participants with Down's syndrome educated in a bilingual vs. monolingual environment vs. neurotypical monolinguals participants matched on developmental age.
- Is the congruence of learning and recall contexts a factor to be taken into account when providing lexical support to participants with Down's syndrome.
- **Hypothesis**
 - Bilingual Down's syndrome children will be less dependent on congruence between pictorial learning and recall contexts than monolingual Down's syndrome children



Experimental task (adapted from Comblain, Elbouz & Thibaut, 2006)



Work flow

Day 1

Lexical training

Immediate post-test

- Name recall
- Designation task
- Naming task

Day 2

Post-test 2

- Name recall
- Designation task
- Naming task

Days 15

Post-test 3

- Name recall
- Designation task
- Naming task

Training phase



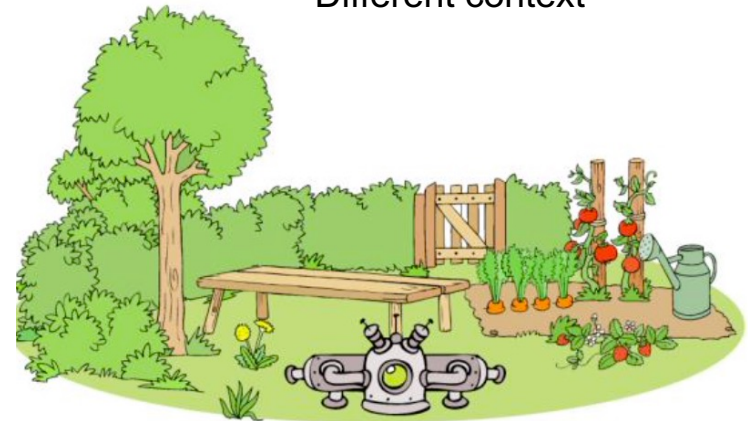
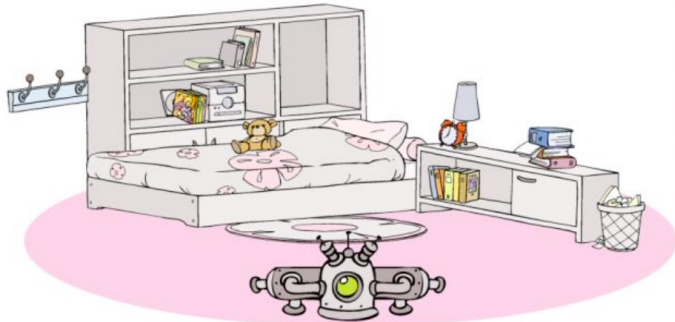
Posttest



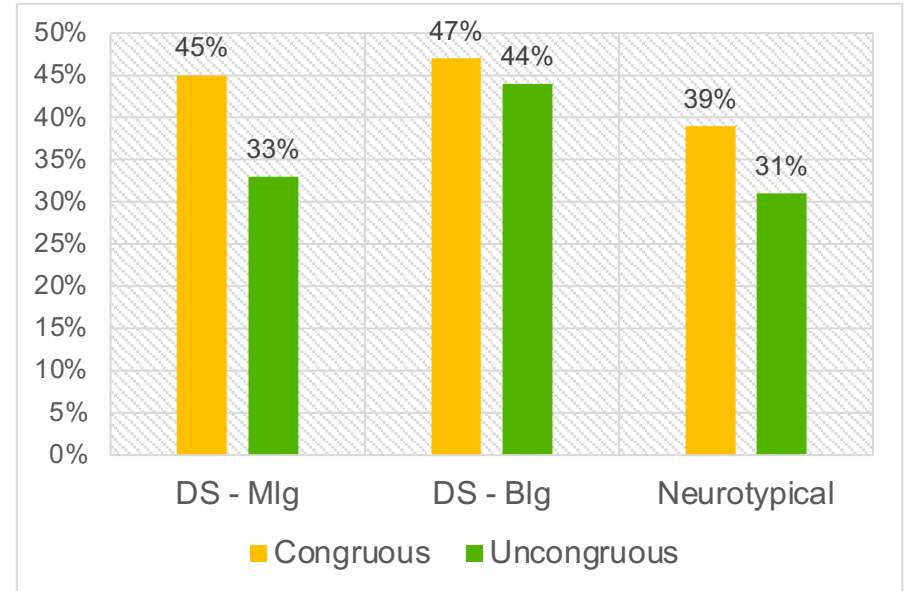
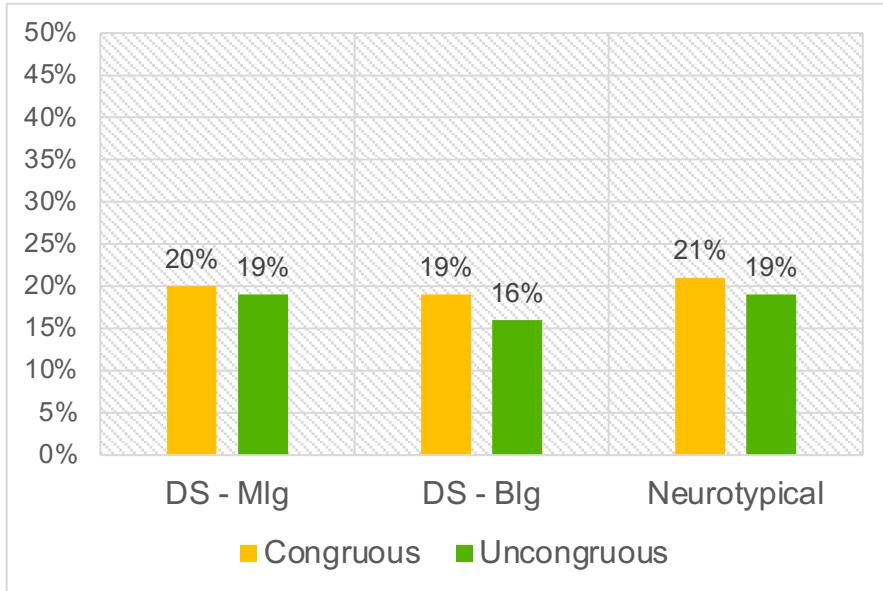
Same context



Different context



Global results – naming and designation



For each condition, the performances of the 3 groups are statistically equivalent, whatever the context and the time.

For all 3 groups, designation performance is better than naming performance

Conclusion



Bilingual Down's syndrome children's performance **is not more dependent on the pictorial context** than that of monolinguals and neurotypical children

In addition

Bilingual Down's syndrome children **do not perform less well** than monolinguals in lexical learning tasks



Bilingual Down's syndrome children's performance **does not deteriorate more over time** than that of monolinguals and neurotypical children



05

Conclusion Towards an optimistic view



Increasing evidence that second language acquisition is not at the expense of the first language in an IDD population (Down's syndrome)



There is no objective reason to advise parents to favour one language (dominant or school language) over the other (home language)



“Clinician should adopt an evidence-based approach when advising parents and making decision around language use in home, community and clinic” (Ward & Sanoudaki, 2023)



Don't forget that when parent interact in their native language with the child, they are better able to convey emotions and information



Increase engagement and potentially more meaningful interactions (Wharton et al., 2000)

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