



Speech, Language and Hearing Sciences

30th World Congress of the I.A.L.P.

Language development of three to twelve-year-old twins compared to singletons

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No disclosures

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Introduction

- Language development in twins tend to lag behind

Authors	subjects	Language aspects	Results
Day, 1932	80 twins Age range: 2-5 y	Expressive vocabulary and syntax Production of the first words	Twins scored weak for expressive vocabulary and syntax. Twins produced their first words at a mean age of 25 months.
Davis, 1937	436 twins and singletons Age range: 5;6y-9;6y.	Articulation, expressive vocabulary and syntax.	Twins scored lower for articulation and expressive vocabulary. No differences between twins and singletons for syntax.



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Authors	subjects	Language aspects	Results
Rutter et al., 2003	96 twins, 98 singletons Age: at 20 months and 3y	Receptive and Expressive language skills using The McArthur Communicative Development Inventory (at 20 months) and the Pre-School Language Scales and McCarthy Scales of Children's Abilities (at 36 months)	Language delay in twins of 1.7 months at the age of 20 months 3.1 months at the age of 3 years.
Gucuyener et al., 2011	162 twins, 124 singletons Age: 5y	Expressive vocabulary using the Peabody Picture Vocabulary Test	Even after excluding premature twins, twins performed worse than singletons and twin girls performed better than twin boys. Preterm twins performed worse than term twins.
Rice et al., 2013	473 twins pairs Age: 24 months	Vocabulary and grammar using the Mac Arthur Communicative Development Inventories: words and sentences	Twins had lower average scores than norms for singletons. Monozygotic twins and boys had lower scores than dizygotic twins and girls.



Shortcomings in the literature

- Mostly based on older studies
- Especially young children
- Parental questionnaires
- Psychological, cognitive test batteries
 - Not appropriate
 - Standardized language batteries are more suitable



Purpose

To compare expressive and receptive language skills of three to twelve-year-old twins with matched singletons using a standardized language battery, the CELF-4-NL

To investigate the language differences between singletons and twins with a normal gestational age at birth by excluding preterm born children.

To investigate whether the language differences between twins and singletons change with increasing age.

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Methods - subjects

TWINS

- n = 23
- 14 ♀, 9 ♂
- Mean age: 5y1m (3;10-11;4)

Inclusion criteria

- Member of a twin
- Normal cognitive development
- Normal education
- Absence of neurological abnormality
- Between 3 and 12 years

SINGLETONS

- n = 23
- 14 ♀, 9 ♂
- Mean age: 5y1m (3;9-11;4)

Inclusion criteria

- Singletons matched for age (+- 3 months) and gender
- Normal cognitive development
- Normal education
- Absence of neurological abnormality
- Between 3 and 12 years

Excluded:
1 twin girl
and
corresponding match
for cognitive
impairment

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Methods – language assessment

- **Clinical Evaluation of Language Fundamentals (CELF-4-NL)**

- For children > 6 years
 - Core Language Index (CLI)
 - Receptive Language Index (RLI)
 - Expressive Language Index (ELI)

- **CELF Preschool-II-NL**

- For children ≤ 6 years
 - Core Language Index (CLI)
 - Receptive Language Index (RLI)
 - Expressive Language Index (ELI)

- **Parental questionnaire**

- Neonatal and socio demographic data

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Methods – statistical analysis

- Data → percentile ranks
- Comparison data twins and singletons
 - Wilcoxon matched-pairs signed-ranks test
- Comparison data term twins and singletons
 - Exclusion of all preterm born children
 - Wilcoxon matched-pairs signed-ranks test
- Correlation between age and language difference between each pair of twins and singletons
 - Spearman correlation

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Results

Neonatal and socio demographic data

- **Socio-economic status**
 - Maternal education level
- Chi square test: $p=0.064$

Education level	Twins n (%)	Singletons n (%)	Total group n (%)
Secondary school	7 (15.2%)	1 (2.2%)	8 (17.4%)
Tertiary education (College)	10 (21.7%)	13 (28.2%)	23 (50%)
Tertiary education (University)	6 (13.0%)	9 (19.6%)	15 (32.6%)

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Results

- Neonatal characteristics

	Twins				Singletons				p-value
	Mean	SD	Min.	Max.	Mean	SD	Min.	Max.	
Mean gestational age at birth (weeks)	35.0	3.6	27.0	38.0	39.4	1.1	37.0	41.0	< 0.001
Birth weight (g)	2519.4	472.9	1700.0	3400	3540.0	375.2	2860	4260.0	< 0.001
Birth length (cm)	47.5	3.0	40.0	52	50.6	2.0	46.0	57.0	< 0.001
Age mother at birth (y)	31.0	3.0	27.0	36	29.8	4.0	24.0	40.0	0.097

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Results

- Comparison twins and singletons

Language indexes	Twins					Singletons					p-value
	n	Mean	SD	Min	Max	n	Mean	SD	Min	Max	
CLI	23	38.11	27.35	4.8	88.5	23	57.21	16.44	9.1	78.8	0.009
RLI	23	44.21	29.15	5.5	95.8	23	68.00	25.10	4.2	95.8	0.011
ELI	23	33.02	24.56	1.0	74.8	23	52.36	17.82	6.3	80.7	0.009

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Results

- Comparison term twins - singletons

language indexes	Twins					Singletons					p-value
	n	Mean	SD	Min	Max	n	Mean	SD	Min	Max	
CLI	10	38.00	27.45	4.8	88.5	10	48.51	17.32	9.1	70.3	0.445
RLI	10	40.82	32.01	5.5	88.5	10	59.82	31.86	4.2	95.8	0.203
ELI	10	31.22	19.73	6.3	60.5	10	49.04	23.00	6.3	80.7	0.047

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Results

- Correlation age – language difference singletons/twins

language indexes	Correlation coefficient	p-value
CLI	0.290	0.179
RLI	0.259	0.233
ELI	0.122	0.580

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Discussion

- **Twins score sign. lower than singletons for expressive and receptive language skills**
 - Mean difference: pc 19,1
 - Mean scores correspond with normal language skills in both groups
 - Language delay is mild!
 - Lower for all language aspects: semantics, morphology, syntax
 - No information about pragmatic skills!
 - // Rutter et al. (2003), Gucuyener et al., 2011; Rice et al. (2014)

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Discussion

- **Possible causes?**
 - **No socio-economic differences**
 - No differences in maternal education level between both groups
 - **Preterm birth**
 - Language delay even between term twins and singletons
 - Difference is not significant for the CLI and the RLI
 - Small sample size
- Preterm birth cannot be (the only) cause of language delay in twins

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Discussion

- **Possible causes?**
 - **Differences in postnatal experiences?**
 - Different patterns in family interaction
 - Parents need to divide their attention
 - Less one-to-one interactions
 - Additional stresses (*Rutter et al., 2003*)
 - Parentese
 - Less and less complex (*Conway et al., 1980*)
 - More directed at both twins
 - Language between siblings
 - more interactions with the same developmental level (*Rutter et al., 2003*)

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- **Cryptophasia ('private language')**:
 - Phenomenon of an autonomous language developed by twins that only the children understand.
 - Developmental phenomenon occurring in both twins and singletons
 - Prevalence is higher in twins (*Thorpe et al. 2001*)
 - More an early indication than a cause

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Discussion

- **Temporary phenomenon??**
 - Literature: not clear, rather a temporary delay,
 - No correlation between age and the difference in language skills between twins and singletons
 - Language delay does not seem to decrease over time
 - Further research in older twins and singletons!

Recent study

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Limitations

- Small sample size
- Absence of IQ data
- Number of siblings should be taken into account
- Pragmatic skills and spontaneous language should be further investigated.

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Reference

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