

Auditory Evoked M100 Response Latency is Delayed in Children with 16p11.2 Deletion but not 16p11.2 Duplication

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Executive summary

- 16p11.2 deletion carriers exhibited delayed M100 latencies
- Differences are larger than in 'idiopathic' ASD
- No observed differences between controls and 16p11.2 duplication carriers

Participants (recruited)

- 137 children
- CHOP: 63, UCSF: 74
- 46 16p11.2 deletion carriers
- 26 16p11.2 duplication carriers
- 66 age-matched controls

Participants (final)

- 99 children
- CHOP: 47, UCSF: 52
- 35 16p11.2 deletion carriers
- 16 16p11.2 duplication carriers
- 48 age-matched controls

Participants (final)

—	Controls	Deletions	Duplications
Age range (years)	7.31 - 17.15	7.98 - 17.03	7.38 - 16.92
Mean age (years)	12.82±2.56	11.32±2.65	11.45±2.41
N (evaluatable)	45	35	16
NVIQ	105.73±11.88	90.09±15.07	83.06±10.68
VIQ	107.24±13.72	85.37±17.05	91.69±14.09
CELF-4	106.22±11.22	75.81±20.80	84.62±13.18
SRS	16.68±11.89	71.51±34.38	72.06±41.22
CTOPP	9.23±1.95	5.64±2.64	7.64±1.45

Procedure

- passive presentation of binaural sinusoidal tones
- recording from whole-head magnetometer
- analysis: artifact rejection, bandpass filtering, source estimation

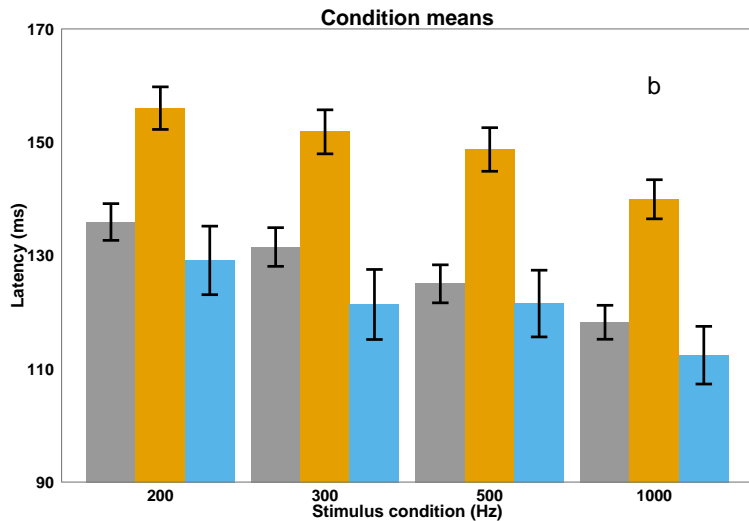
Statistical analysis

- M100 latency: dependent variable
- Linear Mixed Models via lme4
- model: Hemisphere + Stimulus Condition + Case + Age + Site + (Stimulus Condition + Hemisphere | Subject)
- significance: Wald Type II χ^2 tests; Tukey HSD, correlation tests

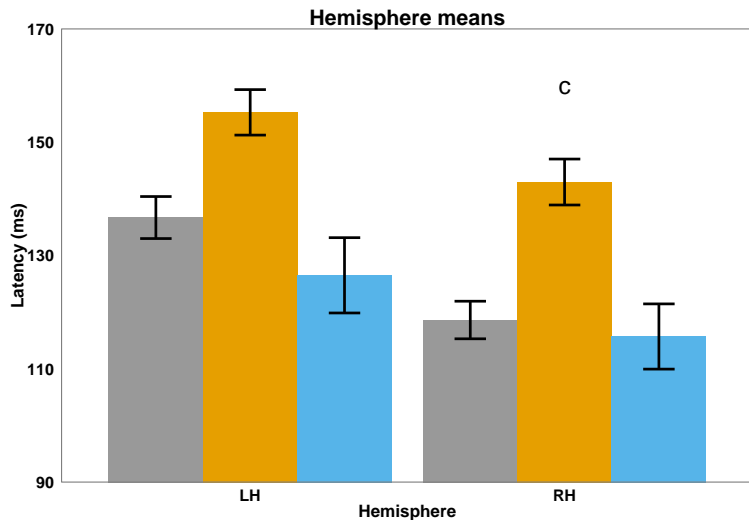
Complete observations

Case	compCases	n	failCases
control	266	384	118
deletion	203	280	77
duplication	65	128	63

M100 latency effects - condition means



M100 latency effects - hemisphere means



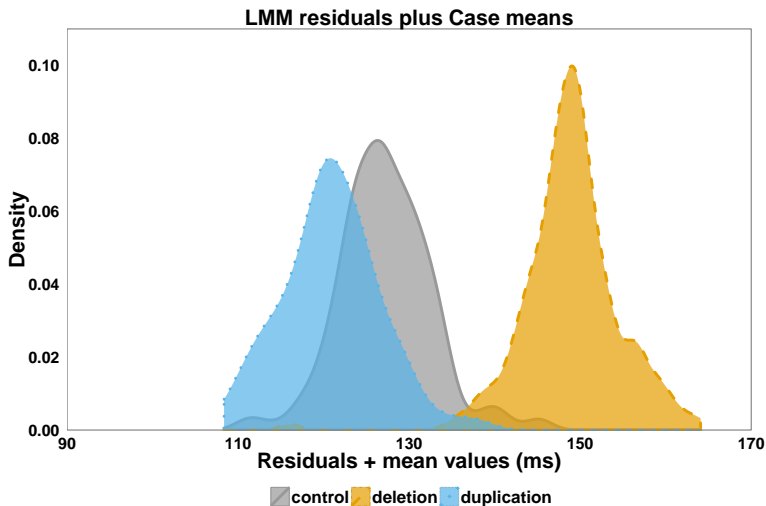
M100 latency effects - mean responses

Mean	Controls	Deletions	Duplications
Overall (ms)	127.2 ± 3.1	149.0 ± 3.6	120.9 ± 5.3
LH (ms)	136.7 ± 3.7	155.3 ± 4.0	126.5 ± 6.6
RH (ms)	118.6 ± 3.3	143.0 ± 4.1	115.7 ± 5.8

Effect size estimation

lhs	rhs	estimate	se	t	p
deletion - control	0	20.9	4.3	4.8	0.0
duplication - control	0	-5.4	5.6	-1.0	0.6
duplication - deletion	0	-26.4	5.6	-4.7	0.0

Variance differences



Conclusion

- main result: ~20 ms delay in M100 component in 16p11.2 deletion carriers
- no observed significant difference between 16p11.2 duplication carriers and controls
- effects not inconsistent with other reported effects
- support for gene-neurophysiology association