

Speech and Language Therapy intervention for children with primary speech and language delay or disorder: the latest research

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The Early Years: from research to policy and practice

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Source

Speech and language therapy interventions for children with primary speech and language delay or disorder: update (2012)

Law, Garrett, Nye and Dennis,

Cochrane Collaboration

Developmental Psychosocial and Developmental Problems Group

Cochrane procedure

- Designed to be an explicit piece of replicable research unlike narrative reviews;
- Cochrane “journal” one of the most highly cited of all health journals;
- Procedures
 - Explicit inclusion and exclusion criteria
 - Randomised controlled trial design
 - Explicit assessment of “risk of bias”
 - Where feasible combination of results and, where not, narrative results

Included

- **Design** Participants were randomly assigned either the experimental group or the control group (e.g., randomized between subjects designs). All other study designs (i.e., case studies, case series, nonrandomized between-subjects designs, multiple baseline designs) are excluded;
- **Participants** Children or adolescents with primary speech and language difficulties. Did not focus on children with learning disabilities, dysarthria, childhood apraxia of speech, learned misarticulations, stammering/voice difficulties or those who were bilingual;
- **Intervention** To improve expressive or receptive phonology, syntax, or vocabulary;
- **Outcomes** relate to speech or expressive or receptive phonology, syntax, or vocabulary.

Comparisons

Speech and Language Therapy Intervention versus No Treatment Controls
Speech and Language Therapy Intervention versus General Stimulation
Speech and Language Therapy Intervention versus Traditional Therapies.

For each of the comparisons outcomes were analysed in eight categories, measuring:

1. Expressive phonology outcomes
2. Phonological recognition and discrimination outcomes
3. Phonological awareness outcomes
4. Expressive syntax outcomes
5. Receptive syntax outcomes
6. Expressive vocabulary outcomes
7. Receptive vocabulary outcomes
8. Composite language outcomes

Risk of bias

- the allocation sequence was adequately generated ('sequence generation');
- the allocation was adequately concealed ('allocation concealment');
- knowledge of the allocated interventions was adequately prevented during the study ('blinding') (blinding was only possible for outcome assessors and not for either staff administering treatment or participants);
- incomplete outcome data were adequately addressed;
- reports of the study were free of suggestion of selective outcome reporting;
- free of other problems that could put it at high risk of bias.

Differences from earlier version

- Searches conducted for the original (2003) version of this review identified 634 records;
- Three sets of comprehensive searches were run subsequently (in 2006, 2009 and 2011) in which a further 987 records were identified.
- 2003 version – 33 studies (25 in meta-analysis)
- 2011 version – 64 studies (54 in meta-analyses)
- 3872 participants

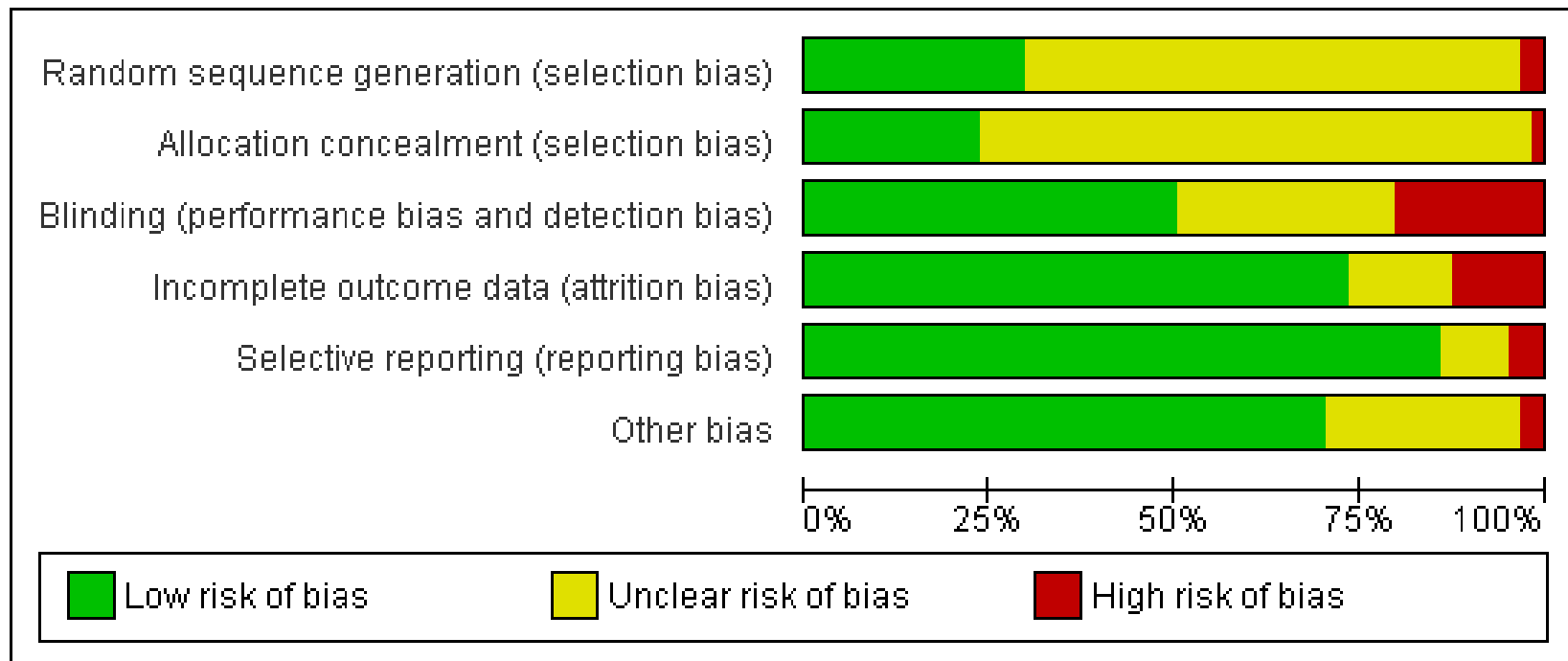
The studies

- Half of the studies within the review (36) included a single comparison between two groups ([Sommers 1966](#); [Barbeito 1972](#); [Fudala 1972](#); [Head 1975](#); [Schwartz 1985](#); [Cole 1986](#); [Wilcox 1991](#); [Eiserman 1992](#); [Barratt 1992](#); [Ruscello 1993](#); [Gibbard 1994a](#); [Girolametto 1996a](#); [Girolametto 1996b](#); [Robertson 1997](#); [Almost 1998](#); [Fay 1998](#); [Munro 1998](#); [Robertson 1999](#); [Sutton 1999](#); [Glogowska 2000](#); [Rvachew 2001](#); [Fey 2002](#); [Evans 2003](#); [Wolfe 2003](#); [Denne 2005](#); [van Kleeck 2006](#); [Gillon 2007](#); [Hesketh 2007](#); [Bowyer-Crane 2008](#); [Dodd 2008](#); [Buschmann 2009](#); [Finestack 2009](#); [Zens 2009](#); [Wake 2011](#); [Washington 2011](#); [Yoder 2011](#)).
- 20 studies included three comparison groups ([Tufts 1959](#); [Mulac 1977](#); [Matheny 1978](#); [Shelton 1978](#); [Courtwright 1979](#); [Lancaster 1991](#); [Fey 1993](#); [Gibbard 1994b](#); [Porkoni 2004](#); [Rvachew 1994](#); [Law 1999](#); [Dixon 2001](#); [Rvachew 2004](#); [Cohen 2005](#); [Gallagher 2005](#); [Bishop 2006a](#); [Broomfield 2006](#); [Ebbels 2006](#); [Wren 2006](#); [Fey 2010](#)).
- Five studies included four comparison groups ([Sommers 1962](#); [Sommers 1964](#); [Reid 1996](#); [Gillam 2006](#); [Tyler 2011](#)) and three studies included five comparison groups ([Bouillion 1973](#); [Boyle 2006](#); [Given 2008](#)).

The studies

- The sample sizes of the studies included within this review range from eight participants ([Dixon 2001](#)) to 730 participants ([Broomfield 2006](#)). However, the *majority* of studies in this review (35) are very small, including between eight and 30 participants each. Only seven studies ([Somers 1966](#); [Glogowska 2000](#); [Boyle 2006](#); [Broomfield 2006](#); [Gillam 2006](#); [Bowyer-Crane 2008](#); [Wake 2011](#)) included more than 100 participants.
- Investigators from twelve studies completed power calculations ([Barratt 1992](#); [Almost 1998](#); [Law 1999](#); [Glogowska 2000](#); [Fey 2002](#); [Cohen 2005](#); [Bishop 2006b](#); [Boyle 2006](#); [Broomfield 2006](#); [Buschmann 2009](#); [Wake 2011](#); [Yoder 2011](#)), but in only six of these ([Almost 1998](#); [Barratt 1992](#); [Glogowska 2000](#); [Yoder 2011](#); [Wake 2011](#)) did the investigators then enrol the number of participants suggested by the calculation.

Risk of bias across six domains (n = 64)



Risk of bias summary

Author (Year)	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding (performance bias and detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Almost 1998	Low	Low	Low	Low	Low	Low
Barbello 1972	Low	Low	Low	Low	Low	Low
Barratt 1992	Low	Low	Low	Low	Low	Low
Bishop 2006a	Low	Low	Low	Low	Low	Low
Bouillion 1973	Low	Low	Low	Low	Low	Low
Bowyer-Crane 2008	Low	Low	Low	Low	Low	Low
Boyle 2006	Low	Low	Low	Low	Low	Low
Broomfield 2006	Low	Low	Low	Low	Low	Low
Buschmann 2009	Low	Low	Low	Low	Low	Low
Cohen 2005	Low	Low	Low	Low	Low	Low
Cole 1986	Low	Low	Low	Low	Low	Low
Courtwright 1979	Low	Low	Low	Low	Low	Low
Denne 2005	Low	Low	Low	Low	Low	Low
Dixon 2001	Low	Low	Low	Low	Low	Low
Dodd 2008	Low	Low	Low	Low	Low	Low
Ebbels 2006	Low	Low	Low	Low	Low	Low
Eiserman 1992	Low	Low	Low	Low	Low	Low
Evans 2003	Low	Low	Low	Low	Low	Low
Fay 1998	Low	Low	Low	Low	Low	Low
Fay 1993	Low	Low	Low	Low	Low	Low
Fey 2002	Low	Low	Low	Low	Low	Low
Fey 2010	Low	Low	Low	Low	Low	Low
Finestack 2009	Low	Low	Low	Low	Low	Low
Fudala 1972	Low	Low	Low	Low	Low	Low
Gallagher 2005	Low	Low	Low	Low	Low	Low
Gilbard 1994a	Low	Low	Low	Low	Low	Low
Gilbard 1994b	Low	Low	Low	Low	Low	Low
Gilliam 2006	Low	Low	Low	Low	Low	Low
Gillon 2007	Low	Low	Low	Low	Low	Low
Girolametto 1996a	Low	Low	Low	Low	Low	Low
Girolametto 1996b	Low	Low	Low	Low	Low	Low
Glogowska 2000	Low	Low	Low	Low	Low	Low
Head 1975	Low	Low	Low	Low	Low	Low
Hesketh 2007	Low	Low	Low	Low	Low	Low
Lancaster 1991	Low	Low	Low	Low	Low	Low
Law 1999	Low	Low	Low	Low	Low	Low
Matheny 1978	Low	Low	Low	Low	Low	Low
Muliac 1977	Low	Low	Low	Low	Low	Low
Munro 1998	Low	Low	Low	Low	Low	Low
Porkoni 2004	Low	Low	Low	Low	Low	Low
Reid 1996	Low	Low	Low	Low	Low	Low
Robertson 1997	Low	Low	Low	Low	Low	Low
Robertson 1999	Low	Low	Low	Low	Low	Low
Ruscello 1993	Low	Low	Low	Low	Low	Low
Rvachew 1994	Low	Low	Low	Low	Low	Low
Rvachew 2001	Low	Low	Low	Low	Low	Low
Rvachew 2004	Low	Low	Low	Low	Low	Low
Schwartz 1985	Low	Low	Low	Low	Low	Low
Shelton 1978	Low	Low	Low	Low	Low	Low
Sommers 1962	Low	Low	Low	Low	Low	Low
Sommers 1964	Low	Low	Low	Low	Low	Low
Sommers 1966	Low	Low	Low	Low	Low	Low
Sutton 1999	Low	Low	Low	Low	Low	Low
Turns 1959	Low	Low	Low	Low	Low	Low
Tyler 2011	Low	Low	Low	Low	Low	Low
van Kleeck 2006	Low	Low	Low	Low	Low	Low
Wake 2011	Low	Low	Low	Low	Low	Low
Washington 2011	Low	Low	Low	Low	Low	Low
Wilcox 1991	Low	Low	Low	Low	Low	Low
Wolfe 2003	Low	Low	Low	Low	Low	Low
Wren 2006	Low	Low	Low	Low	Low	Low
Yoder 2011	Low	Low	Low	Low	Low	Low
Zens 2009	Low	Low	Low	Low	Low	Low

Phonological development



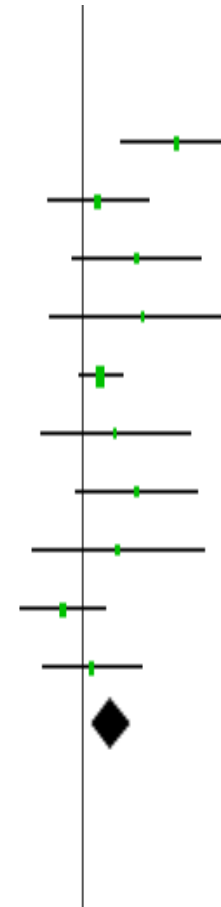
Phonological development

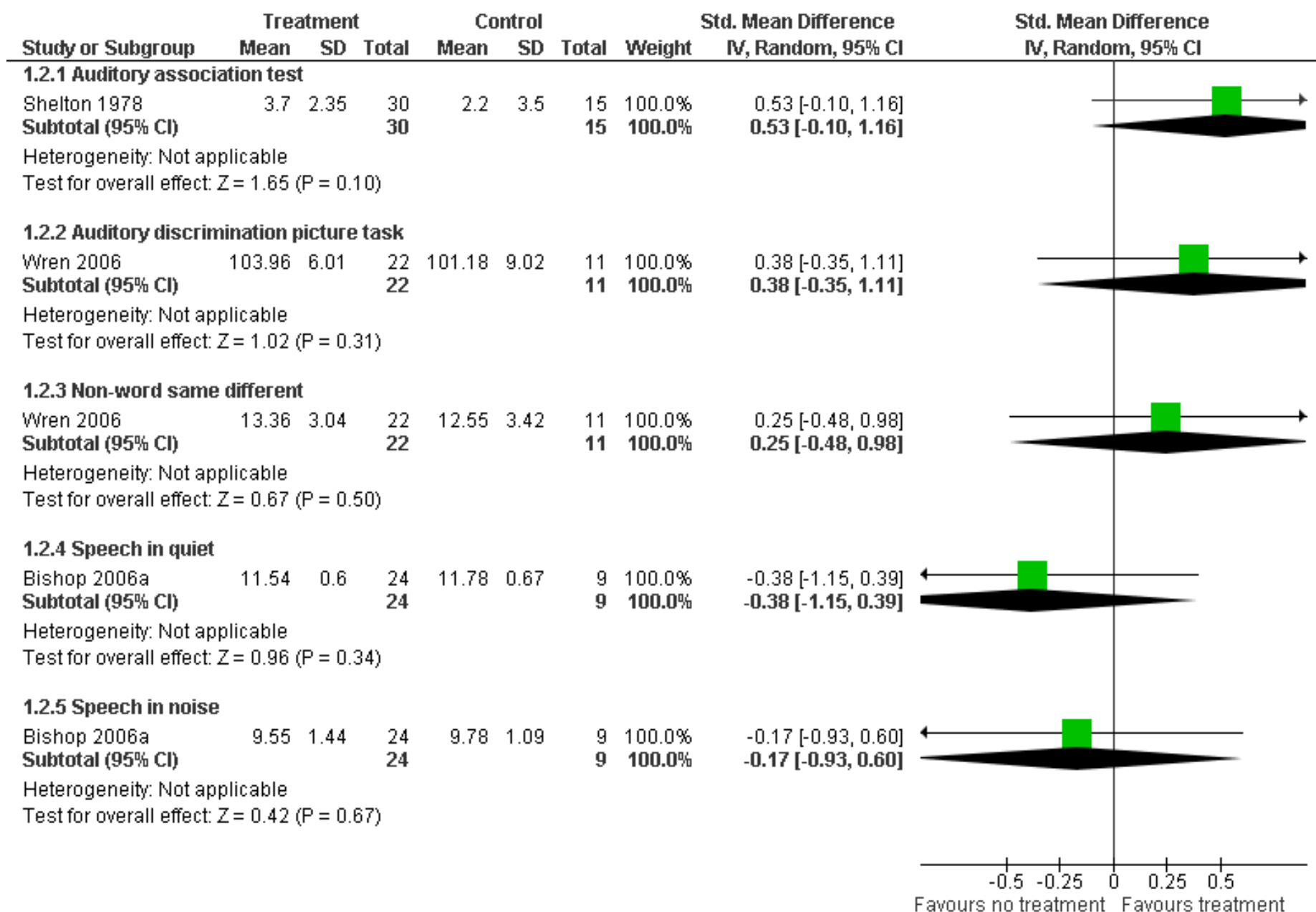
1.1.3 Measures of overall phonological development (single word)

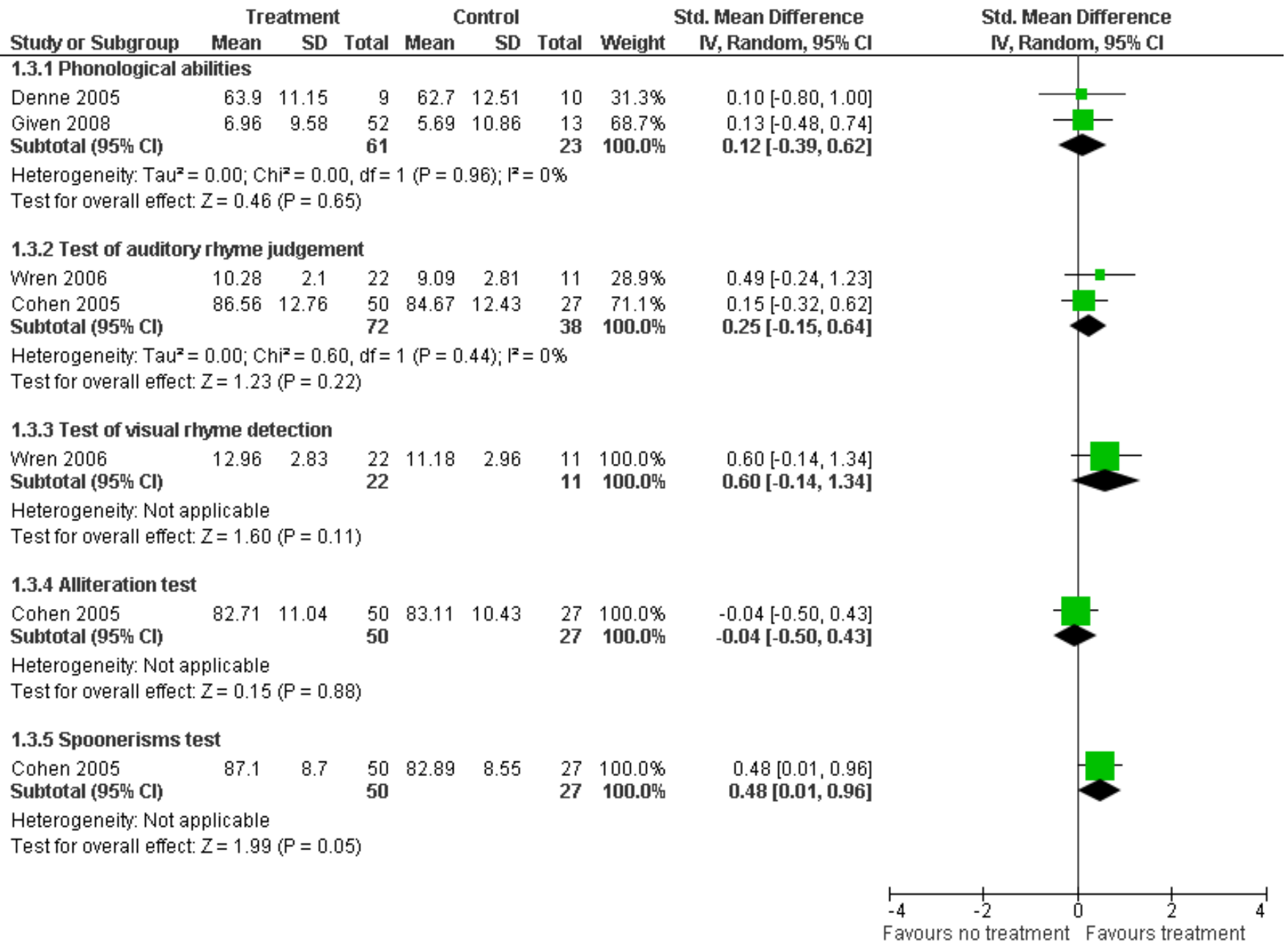
Almost 1998	48.2	10.9	15	34.7	7.9	15	9.5%	1.38 [0.57, 2.19]
Bouillion 1973	10.36	7.76	34	8.4	9.1	9	10.8%	0.24 [-0.50, 0.98]
Denne 2005	12.53	7.47	9	7.12	5.48	10	7.5%	0.80 [-0.15, 1.74]
Fay 1998	-31.05	7.41	4	-39.75	9.59	6	4.1%	0.89 [-0.47, 2.25]
Glogowska 2000	-27.2	22.76	71	-34.35	28.66	88	24.4%	0.27 [-0.04, 0.59]
Lancaster 1991	-36.59	19.17	10	-45.6	12.51	5	6.0%	0.49 [-0.61, 1.58]
Matheny 1978	-6.62	2.39	16	-8.87	3.23	8	8.3%	0.81 [-0.08, 1.69]
Munro 1998	75.14	14.14	7	68.25	5.45	4	4.7%	0.53 [-0.73, 1.79]
Shelton 1978	7.55	5.45	30	9.7	11.2	15	13.5%	-0.27 [-0.89, 0.35]
Wren 2006	61.87	15.31	22	59.73	12.77	11	11.1%	0.14 [-0.58, 0.87]
Subtotal (95% CI)			218			171	100.0%	0.42 [0.13, 0.72]

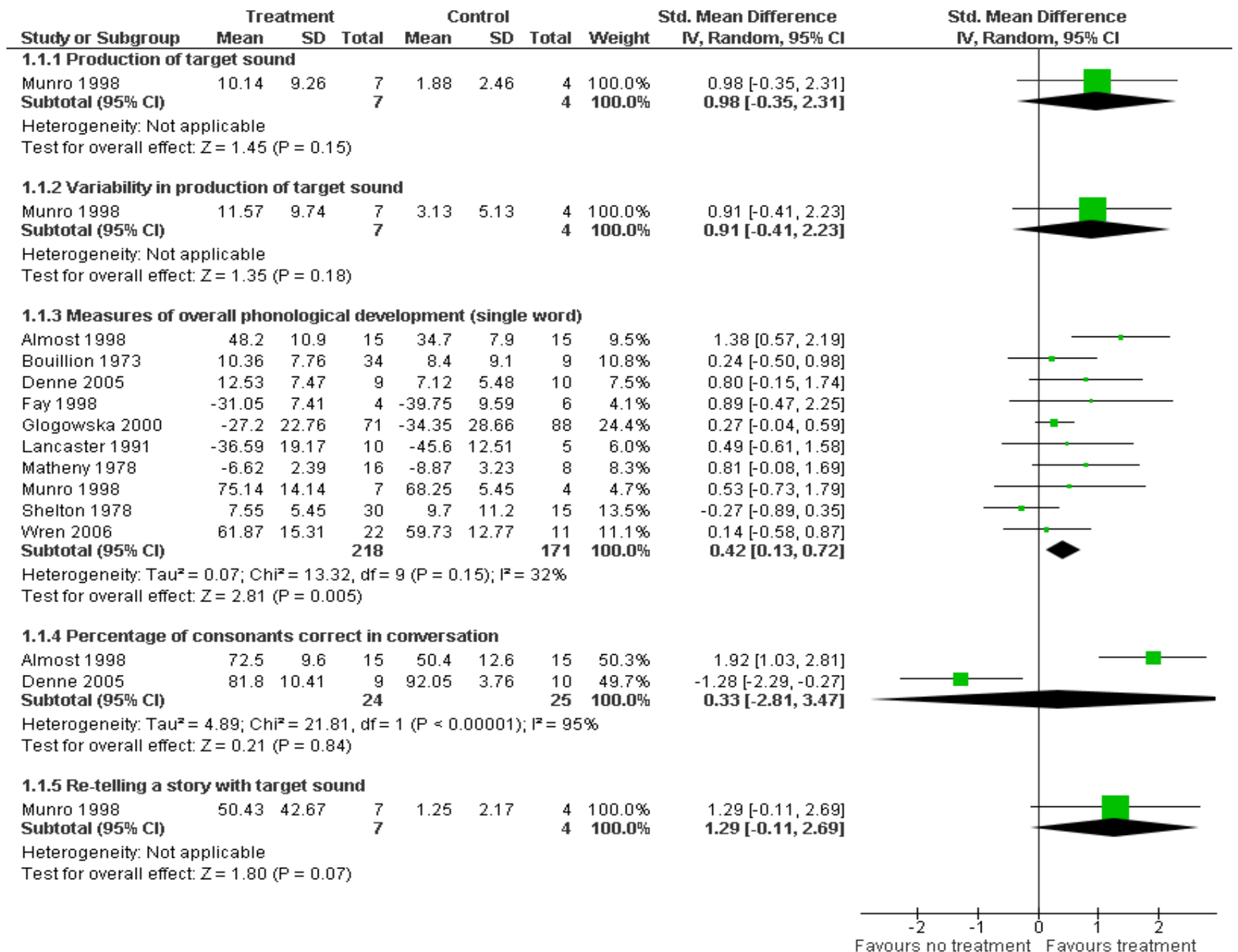
Heterogeneity: $\tau^2 = 0.07$; $\chi^2 = 13.32$, $df = 9$ ($P = 0.15$); $I^2 = 32\%$

Test for overall effect: $Z = 2.81$ ($P = 0.005$)



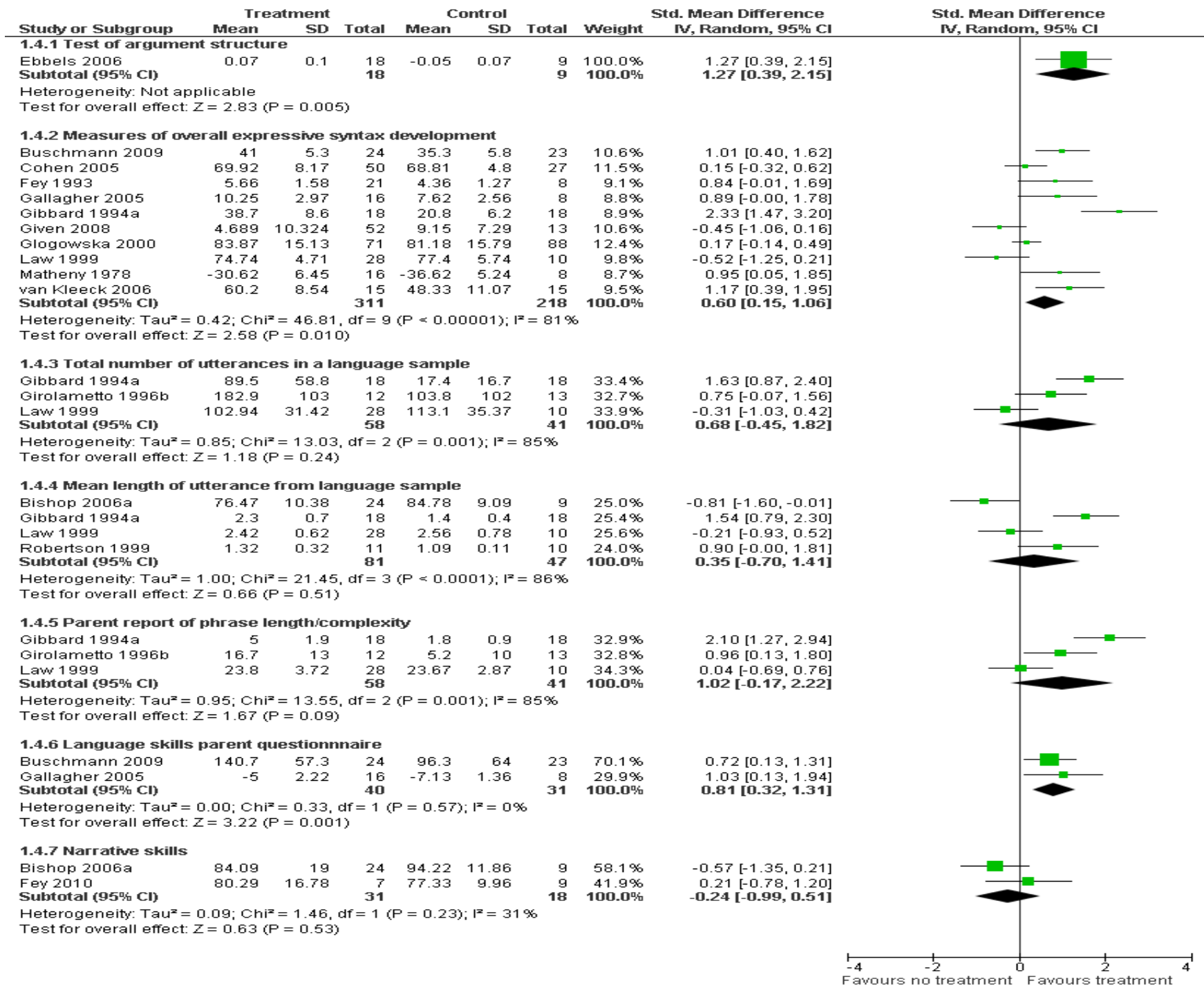


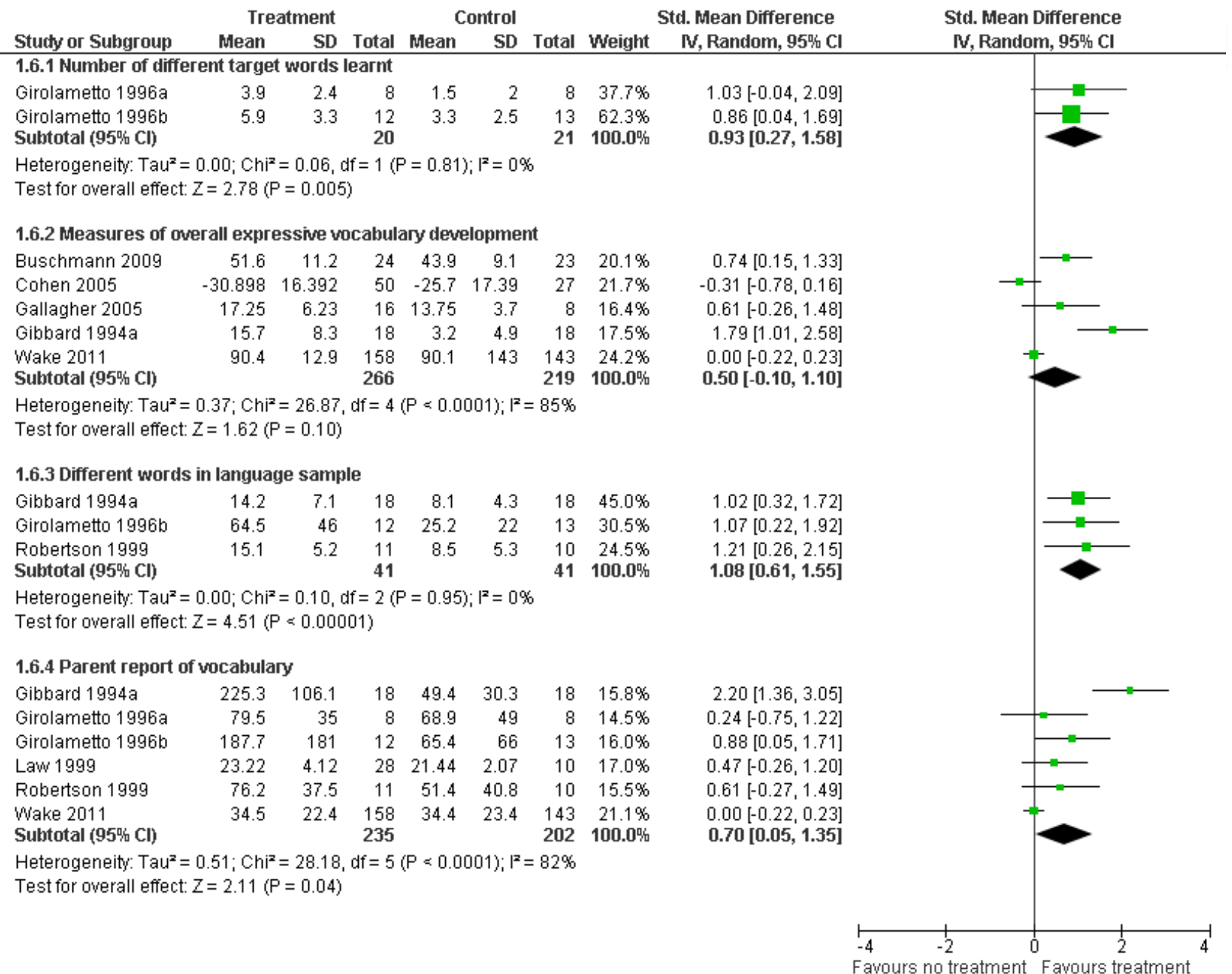


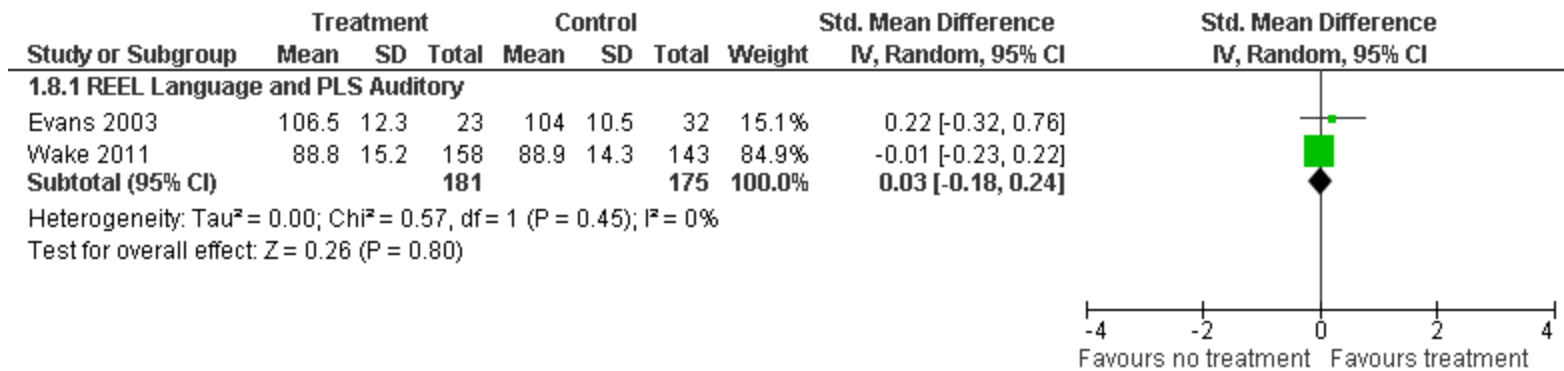


Expressive language development



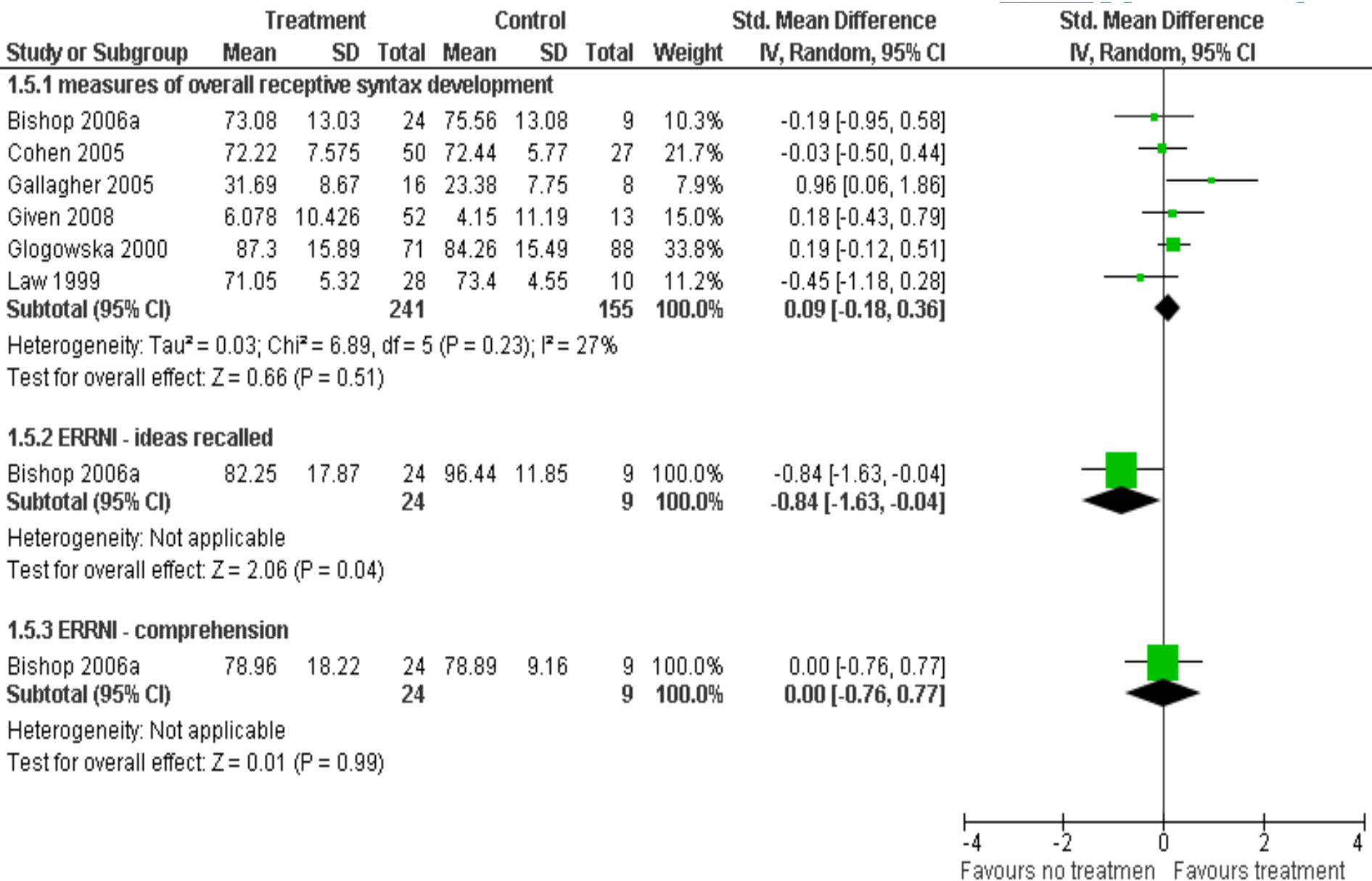


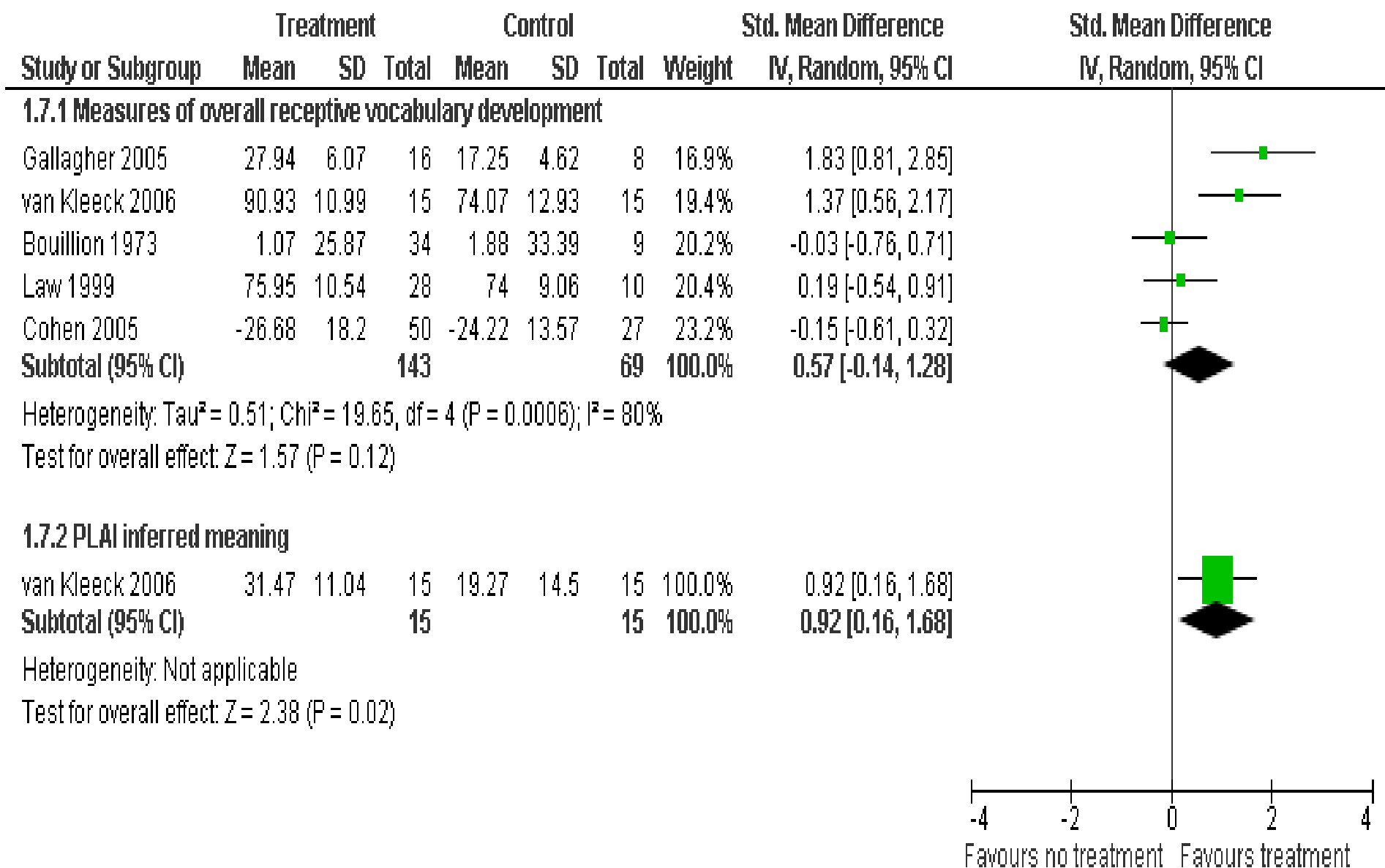




Receptive language development

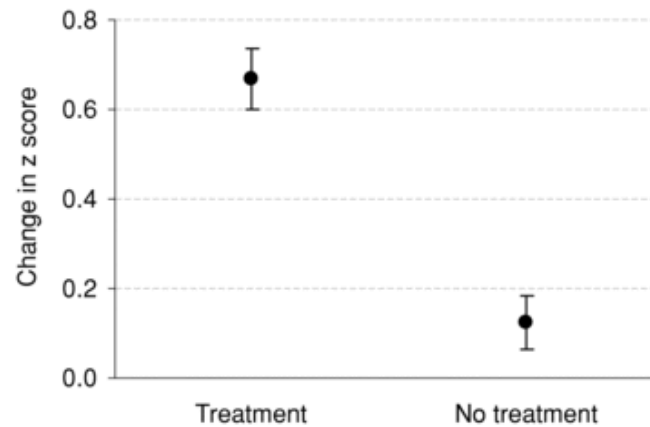






And narrative reporting?

Is speech and language therapy effective for children with primary speech and language impairment?
Report of a randomized control trial - Broomfield et al



Summary

- Results extend those of previous version – positive outcomes from phonology and expressive language – no progress on receptive language;
- Numbers increasing but likewise heterogeneity;
- Multi-arm trials still a feature of this literature;
- Increasing differentiation of outcomes but how robust are they in measuring change?
- Although bias is not a major problem there remain concerns about sample sizes and power;
- Less emphasis on parents, more on other modes of delivery (computers);
- Almost no replication.

New directions

- An immensely creative field which continues to generate new studies, incorporating new measures and new interventions;
- New directions? – oral language/reading; pragmatics; computers; priming studies/Latin Square designs;
- Use of these data as a standard set for other purposes – dosage, economic modelling;
- Interventions where the delivery is school based (Wave 1) not “speech and language therapy”;
- Evaluation of service delivery models across universal, targeted and specialist interventions (Waves 1-3);
- Moderator analyses;
- Greater awareness of “evidence based practice” and “practice based evidence” (MCRI policy brief 21) – Better Communication Research Programme What Works Resource.

More information?....

- Law J, Garrett Z, & Nye C. (2003 update 2012). Speech and language therapy interventions for children with primary speech and language delay or disorder (Cochrane Review). In: *Reviews* 2009, Issue 3. Art. No.: CD004110. DOI: 10.1002/14651858.CD004110.

<http://summaries.cochrane.org/CD004110/speech-and-language-therapy-interventions-for-children-with-primary-speech-and-language-delay-or-disorder>

- Cochrane Collaboration <http://www.cochrane.org/>
- Developmental Psychosocial and Learning Problems Group <http://dplpg.cochrane.org/>
- Better Communication Research Programme