

Appendix A. Results of descriptive coding

#	Study (year)	Journal	Age Group	Proficiency	SL or FL	Educational setting	Explicit or Implicit	Delivery of instruction	Lab vs. Classroom
1	Akakura (2012)	LLR	adult	HIGH	SL	N/A	explicit	computer	classroom
2	Ammar & Spada (2006)	SSLA	young	NA	FL	primary	both	face-to-face	classroom
3	Andringa et al. (2011)	LL	adolescent	LOW	SL	secondary	both	computer	classroom
4	Caroll & Swain (1993)	SSLA	adult	MID	SL	language institute	both	face-to-face	lab
5	Day & Shapson (1991)	LL	adolescent	NA	SL	secondary	explicit	face-to-face	classroom
6	de Graaff (1997)	SSLA	adult	LOW	N/A	university	explicit	computer	lab
7	De Jong (2005)	SSLA	adult	LOW	N/A	university	implicit	computer	lab
8	DeKeyser & Sokalski (1996) (Part 1)	LL	adult	LOW	FL	university	explicit	pen and paper	classroom
8	DeKeyser & Sokalski (1996) (Part 2)	LL	adult	LOW	FL	university	explicit	pen and paper	classroom
9	Doughty (1991)	SSLA	N/A	MID	SL	language institute	both	computer	lab
10	Ellis et al. (2006)	SSLA	adult	MID	SL	language institute	both	face-to-face	lab
11	Erlam (2003)	MLJ	adolescent	MID	FL	secondary	both	face-to-face	classroom
12	Fernández (2008)	SSLA	adult	MID	FL	university	both	computer	lab
13	Fotos & Ellis (1991) (Part 1)	TQ	adult	mixed	FL	university	explicit	face-to-face	classroom
13	Fotos & Ellis (1991) (Part 2)	TQ	adult	mixed	FL	university	explicit	face-to-face	classroom
14	Goo (2012)	SSLA	adult	MID	FL	university	both	face-to-face	lab
15	Han (2002)	TQ	N/A	MID	SL	language institute	implicit	face-to-face	classroom
16	Harley (1989)	AL	young	MID	SL	primary	explicit	face-to-face	classroom
17	Henshaw (2012)	LTR	adult	MID	FL	university	explicit	computer	lab
18	Hinenoya & Lyster (2014)	LTR	adult	mixed	FL	graduates	explicit	computer	lab
19	Iwashita (2003)	SSLA	adult	LOW	FL	university	both	face-to-face	lab
20	Izumi (2002)	SSLA	adult	MID	SL	university	implicit	computer	lab
21	Karchava & Ammar (2014)	LTR	adult	MID	SL	university	implicit	face-to-face	classroom
22	Lee (2007)	LL	adolescent	HIGH	FL	secondary	implicit	face-to-face	classroom
23	Leeman (2003)	SSLA	adult	LOW	FL	university	implicit	face-to-face	lab
24	Leow (1998)	MLJ	N/A	LOW	FL	language institute	both	face-to-face	classroom
25	Li, Qingping (2012)	TQ	adolescent	LOW	FL	secondary	both	face-to-face	classroom
26	Li, Shaofeng (2013)	MLJ	adolescent	mixed	FL	university	both	face-to-face	lab
27	Li, Shuai (2012)	LL	adult	MID	both	university	implicit	combined	lab
28	Long et al. (1998) (Part 1)	MLJ	adult	LOW	FL	university	implicit	face-to-face	lab
28	Long, et al. (1998) (Part 2)	MLJ	adult	MID	FL	university	implicit	face-to-face	lab
29	Loschky (1994)	SSLA	adult	mixed	FL	university	implicit	face-to-face	lab
30	Lyddon (2011)	MLJ	adult	LOW	FL	university	both	computer	lab
31	Lyster (1994)	AL	adolescent	HIGH	SL	secondary	both	face-to-face	classroom
32	Lyster (2004)	SSLA	young	NA	SL	primary	both	face-to-face	classroom
33	Marsden & Chen (2011)	LL	young	HIGH	FL	primary	implicit	computer	lab
34	Morgan-Short & Bowden (2006)	SSLA	mixed	LOW	FL	university	implicit	computer	lab

35	Nagata (1993)	MLJ	adult	MID	FL	university	explicit	computer	lab
36	Rassaei (2014)	MLJ	adult	MID	FL	language institute	both	face-to-face	lab
37	Rassaei (2015)	LTR	adult	MID	FL	graduate	implicit	face-to-face	classroom
38	Révész (2009)	SSLA	mixed	mixed	FL	secondary	implicit	combined	lab
39	Révész (2012)	LL	mixed	LOW	FL	secondary	implicit	combined	lab
40	Révész, et al. (2014)	LL	adult	MID	SL	university	implicit	face-to-face	lab
41	Rosa and O'Neill (1999)	SSLA	adult	MID	FL	university	both	pen and paper	lab
42	Sagarra and Abbuhl (2013)	MLJ	adult	LOW	FL	university	implicit	computer	lab
43	Sheen (2008)	LL	adult	MID	SL	university	implicit	face-to-face	classroom
44	Sheen (2010)	SSLA	N/A	MID	SL	mixed	both	face-to-face	classroom
45	Shintani (2012)	LTR	young	LOW	FL	primary	implicit	face-to-face	classroom
46	Shintani and Ellis (2010)	SSLA	young	LOW	FL	primary	both	face-to-face	classroom
47	Shintani et al. (2014)	LL	adult	LOW	FL	university	explicit	face-to-face	classroom
48	Stafford et al. (2012)	LL	adult	LOW	FL	university	explicit	computer	lab
49	Stefanou and Révész (2015)	MLJ	adolescent	MID	FL	secondary	explicit	face-to-face	classroom
50	Vanpatten & Cadierno (1993)	SSLA	adolescent	MID	FL	secondary	explicit	face-to-face	classroom
51	VanPatten & Oikkenon (1996)	SSLA	adolescent	MID	FL	secondary	both	face-to-face	classroom
52	White et al. (1991)	AL	young	LOW	FL	primary	both	face-to-face	classroom
53	Yang & Lyster (2010)	SSLA	adult	HIGH	FL	university	both	face-to-face	classroom
54	Yilmaz (2012)	LL	adult	LOW	FL	N/A	both	combined	lab

Results of descriptive coding (continued)

#	Study (year)	Total treatment sessions	Length of each treatment session	Intensity of treatment (total treatment)	Duration of instruction (days)	Mode of outcome measures (Written vs. Oral)	Type of outcome measures
1	Akakura (2012)	3	less than 60 min	180 min	7	Combined	MJ, CCR, FCR
2	Ammar & Spada (2006)	12	30-45 min	480 min	28	Combined	MJ, CCR, FCR
3	Andringa et al. (2011)	N/A	60 min	60 min	90-120	Written	MJ,FCR
4	Caroll & Swain (1993)	2	N/A	N/A	1	N/A	MJ
5	Day & Shapson (1991)	N/A	180 min	N/A	35-49	Combined	CCR,FCR
6	de Graaff (1997)	10	N/A	N/A	35	Written	MJ, CCR
7	De Jong (2005)	4	90 min	360 min	14	Combined	MJ,SR,CCR
8	DeKeyser & Sokalski (1996) (Part 1)	5	25-50 min	250 min	5	Written	SR,CCR
8	DeKeyser & Sokalski (1996) (Part 2)	5	25-50 min	250 min	5	Written	SR,CCR
9	Doughty (1991)	10	N/A	N/A	10	Combined	MJ,CCR
10	Ellis et al. (2006)	2	30 min	60 min	2	Combined	MJ,CCR
11	Erlam (2003)	3	45 min	75 min	7	Combined	CCR,FR
12	Fernández (2008)	1	N/A	N/A	1	Written	SR
13	Fotos & Ellis (1991) (Part 1)	1	20 min	20 min	1	Written	MJ
13	Fotos & Ellis (1991) (Part 2)	1	20 min	20 min	1	Written	MJ
14	Goo (2012)	2	20 min	40 min	2	Written	MJ, CCR
15	Han (2002)	8	N/A	N/A	60	Combined	FCR
16	Harley (1989)	N/A	N/A	N/A	56	Combined	SR,FR
17	Henshaw (2012)	1	N/A	N/A	1	Written	SR
18	Hinenoya & Lyster (2014)	3	1.5 to 2 hr	6 hr	3	Written	CCR
19	Iwashita (2003)	N/A	N/A	N/A	N/A	Oral	FCR
20	Izumi (2002)	6	N/A	N/A	14	Written	MJ,SR,CCR
21	Karchava & Ammar (2014)	2	120 min	240 min	2	Combined	CCR, FCR
22	Lee (2007)	3	20 min	60 min	14	Written	CCR
23	Leeman (2003)	1	20 min	20	1	Oral	FCR
24	Leow (1998)	1 or 2 *	N/A	N/A	1	Written	SR,CCR
25	Li, Qingping (2012)	3	45 min	135	21	Written	CCR
26	Li, Shaofeng (2013)	1	40-45 min	45	1	Combined	MJ,CCR
27	Li, Shuai (2012)	2	20-30 min	50 min	2	Oral	SR,CCR
28	Long et al. (1998) (Part 1)	1	N/A	40 min	1	Oral	CCR
28	Long, et al. (1998) (Part 2)	1	N/A	40 min	1	Combined	CCR
29	Loschky (1994)	3	15-30 min	90 min	3	Written	SR
30	Lyddon (2011)	1	N/A	N/A	1	Written	CCR

31	Lyster (1994)	N/A	N/A	N/A	N/A	Combined	SR,FCR
32	Lyster (2004)	N/A	9 hr	N/A	35	Combined	SR,CCR,FCR
33	Marsden & Chen (2011)	4	40 min	160 min	4	Combined	MJ,CCR,FCR
34	Morgan-Short & Bowden (2006)	1	1 hour	60 min	1	Written & Aural	SR,CCR
35	Nagata (1993)	6	N/A	N/A	7	Written	CCR
36	Rassaei (2014)	3	14 to 24 min	60 min	7	Combined	MJ,FCR
37	Rassaei (2015)	4	35 min	135 min	7	Combined	FCR
38	Révész (2009)	3	15 min	45	1	Combined	FCR
39	Révész (2012)	3	15 min	45	1	Combined	MJ,FCR
40	Révész, et al. (2014)	2	20-25 min	50	14	Written	SR,FCR
41	Rosa and O'Neill (1999)	1	N/A	N/A	1	Written	SR
42	Sagarra and Abbuhl (2013)	1	50 min	50	35	Combined	SR,CCR,FCR
43	Sheen (2008)	2	N/A	N/A	21	Written	MR,CCR,FCR
44	Sheen (2010)	2	5 to 30 min	60	1	Written	MR,CCR,FCR
45	Shintani (2012)	9	N/A	N/A	35	Combined	SR,CC
46	Shintani and Ellis (2010)	6	30-40 min	240	21	Combined	SR,CC
47	Shintani et al. (2014)	1	5 to 20 min	20 min	1	Written	FCR
48	Stafford et al. (2012)	1	N/A	N/A	1	Written & Aural	MR,SR,CCR
49	Stefanou and Révész (2015)	2	10 min	20	2	Written	SR,FCR
50	Vanpatten & Cadierno (1993)	2	N/A	N/A	2	Written	SR,CCR
51	VanPatten & Oikkenon (1996)	4	N/A	N/A	4	Written & Aural	SR,CCR
52	White et al. (1991)	N/A	8 hr	N/A	14	Combined	MJ,CCR,FCR
53	Yang & Lyster (2010)	N/A	120 min	N/A	14	Combined	FR
54	Yilmaz (2012)	2	N/A	N/A	N/A	Combined	SR,CCR

Note. *1 for a single exposure group, 2 for a multiple exposure group

MJ: Metalinguistic judgment, SR: Selected response, CCR: Constrained constructed response, FCR: Free constructed response

Appendix B. A summary of the effect sizes of the individual studies

Primary Studies	Effect size (<i>g</i>)	Standard Error	95% CI Lower Limit	95% CI Upper Limit
1. Akakura(2012)	0.64	0.21	0.22	1.05
2. Ammar & Spada (2006)	0.65	0.43	-0.19	1.48
3. Andringa de Glopper & Hacquebord (2011)	0.43	0.25	-0.06	0.98
4. Carroll & Swain (1993)	1.51	0.36	0.81	2.21
5. Day & Shapson (1991)	0.92	0.12	0.69	1.16
6. de Graff (1997)	1.57	0.22	1.14	1.98
7. De Jong (2005)	-0.22	0.32	-0.86	0.41
8. Dekeyser & Sokalski (1996)	3.77	0.68	2.44	5.09
9. Doughty (1991)	0.19	0.52	-0.84	1.21
10. Ellis Loewen & Erlam (2006)	0.35	0.42	-0.48	1.17
11. Erlam (2003)	0.81	0.31	0.21	1.42
12. Fernandez(2008)	0.41	0.29	-0.16	0.98
13. Fotos&Ellis (1991)	1.98	0.45	1.09	2.86
14. Goo (2012)	1.22	0.44	0.36	2.08
15. Harley (1989)	3.55	1.04	1.51	5.56
16. Han (2002)	2.57	0.90	0.82	4.33
17. Henshaw(2012)	0.34	0.26	-0.16	0.84
18. Hinenoya & Lyster (2015)	0.67	0.22	0.23	1.10
19. Iwashita (2003)	0.77	0.31	0.15	1.86
20. Izumi (2002)	0.52	0.29	-0.04	1.09
21. Kartchava& Ammar (2014)	0.29	0.30	-0.31	0.88
22. Lee (2007)	1.05	0.18	0.69	1.41
23. Leeman (2003)	1.52	0.40	0.74	2.30
24. Leow (1998)	-0.12	0.30	-0.70	0.46
25. Li, Q. (2012)	-0.01	0.18	-0.36	0.33
26. Li, S. (2012)	1.2	0.47	0.29	2.13
27. Li, S. (2013)	1.0	0.25	0.50	1.50
28. Long, Inagaki & Ortega (1998)	1.05	0.52	0.02	2.07
29. Loschky (1994)	0.18	0.38	-0.56	0.91
30. Lyddon (2011)	2.87	0.95	2.19	3.56
31. Lyster (1994)	1.21	0.22	0.77	1.64
32. Lyster, R. (2004)	1.24	0.32	0.62	1.87
33. Marsden, E., & Chen, H.-Y. (2011)	0.89	0.38	0.15	1.62
34. Morgan-Short& Bowden (2006)	1.78	0.45	0.90	2.65
35. Nagata (1993)	0.27	0.34	-0.39	0.93

36. Rassaei, E. (2014)	1.82	0.34	1.16	2.48
37. Rassaei, E. (2015)	0.77	0.33	0.14	1.41
38. Révész, A. (2009)	6.19	0.80	4.60	7.72
39. Révész, A. (2012)	3.95	0.50	2.96	4.93
40. Révész, Sachs, & Hama (2014)	0.69	0.44	-0.17	1.55
41. Rosa & O'Neill (1999)	-0.19	0.38	-0.94	0.57
42. Sagarra & Abbuhl(2013)	3.89	0.47	2.97	4.81
43. Sheen (2008)	0.19	0.43	-0.67	1.04
44. Sheen (2010)	0.47	0.27	-0.06	0.99
45. Shintani(2012)	0.98	0.39	0.22	1.74
46. Shintani & Ellis (2010)	2.05	0.50	1.07	3.03
47. Shintani, Ellis, Suzuki (2014)	1.37	0.30	0.77	1.96
49. Stafford, Bowden & Sanz (2012)	1.08	0.40	0.29	1.88
49. Stefanou & Révész (2015)	0.46	0.27	-0.06	0.98
50. VanPatten and Cardino (1993)	1.75	0.32	1.12	2.38
51. VanPatten & Oikkenon(1996)	-0.70	0.33	-1.14	-0.06
52. White et al. (1991)	1.15	0.23	0.70	1.60
53. Yang & Lyster (2001)	0.47	0.30	-0.12	1.06
54. Yilmaz (2012)	0.98	0.37	0.25	1.70
