

Valutazione Rinnovi Settembre - Ottobre 2016 - Ricercatori a tempo determinato settori bibliometrici											Controdeduzioni							
Nonnativo	Ruolo	Area SSD	SC	Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali (2006 - 2016)	Num. Citazioni	H Index	Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali (2006-2016)	Num. Citazioni normalizzato	Hc	Fascia Mediane	Mediana Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali normalizzato	Mediana Num. Citazioni normalizzato	Mediana Hc	Superamento due mediane	Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali normalizzato	Num. Citazioni normalizzato	Hc	Superamento due mediane
DATTILO Giuseppe	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	6	MED/11	06/D1	59	17	59	50,89	16	PA	35	41,99	11	SI				
ROMEO Orazio	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	5	BIO/18	05/O1	36	11	36	31,42	10	PA	62,5	87,69	16	SI				
CASTIGLIONE Claudia	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	11	M-PSI/05	11/E3	17	3	17	1,13	3	PA	19	28,41	9	SI				
BONACCORSO Brunella	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	8	ICAR/02	08/A1	12	6	12	27,73	7	PA	5	1,45	3	SI				
NASTASI Francesco	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	3	CHIM/02	03/A2	32	19	32	103,4	14	PA	7,5	3,53	3,5	SI				
RAIMONDO Fabio	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	5	BIO/04	05/A2	18	14	18	31,11	12	PA	9	4,25	4	SI				
SORRENTI Luana	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	11	M-PSI/04	11/E2	7	2	7	0,56	2	PA	34,5	34,27	10	SI				
GIOPRE Salvatore	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	3	CHIM/06	03/C1	39	10	39	28	11	PA	42,5	46,01	11	SI				
										PO	14	24,45	8,5	SI				
										PO	20	35,07	10	NO	10	0,875	3	SI
										PO	7	1,35	3	SI				
										PO	33	42,47	10	SI				
										PO	41,3	53,45	12	SI				

**Valutazione Rinnovi Settembre - Ottobre 2016 - Ricercatori a tempo determinato settori non bibliometrici**

Nominativo	Ruolo	Area	SSD	SC	Num. libri >= 2006	Num. Capitoli di libro e/o Articoli su riviste scientifiche >= 2006	Num. Articoli su riviste di fascia A >= 2006	Num. libri normalizzato	Num. Capitoli di libro e/o Articoli su riviste scientifiche normalizzato	Num. Articoli su riviste di fascia A normalizzato	Fascia Mediane	Mediana num. libri normalizzato	Capitoli di libro e/o Articoli su riviste scientifiche normalizzato	Mediana num. Articoli su riviste di fascia A normalizzato	Superamento una mediana
ARIZZI Cristina	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	10	L-LIN/12	10/L1	1	5	0	1	5	0	PA	1	12	1	NO
CARABETTA Stefano	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	12	IUS/02	12/E2	2	11	0	2	11	0	PA	2	11,5	2	SI
RUSSO Antonio	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	14	SPS/04	14/A2	5	17	2	6,25	21,25	2,5	PA	1,05	14	1	SI
MARCHESE Claudio	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	8	ICAR/14	08/D1	0	22	0	0	22	0	PA	2	12	0	SI
DE MARCO Santa	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	12	IUS/12	12/D2	1	20	5	1	20	5	PA	1	15	6	SI
ZAMPIERI Pier Paolo	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	14	SPS/10	14/D1	2	11	1	2,5	13,75	1,25	PA	2	12	2	SI
GRADI Marco	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	12	IUS/15	12/F1	2	43	11	2	43	11	PA	1,25	17	7	SI
CINICI Maria Cristina	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	13	SECS-P/08	13/B2	2	14	1	2	14	1	PA	2	14	0	SI

**Valutazione Rinnovi Settembre - Ottobre 2016 - Ricercatori a tempo determinato settori biometrici**

Nominativo	Ruolo	Area	SSD	SC	Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali (2005 - 2015)	Num. Citazioni	H Index	Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali (2005 - 2015)	Num. Citazioni normalizzato	Hc	Fascia Mediane	Mediana Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali normalizzato	Mediana Num. Citazioni normalizzato	Mediana Hc	Superamento due mediane
DATTILO Giuseppe	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	6	MED/11	06/D1	59	551	17	59	55,1	17	PA	62,5	87,69	16	SI
ROMEO Orazio	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	5	BIO/18	05/E1	36	377	11	36	34,27	8	PA	19	28,41	9	SI
C'ASTIGLIONE Claudia	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	11	M-PSI/05	11/E3	17	17	3	17	1,21	3	PA	4,5	1,5	2,5	SI
BONACCORSO Brunella	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	8	KCAR/02	08/A1	13	416	6	13	29,71	8	PA	7,5	3,53	3,5	SI
NASTASI Francesco	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	3	CHIM/02	03/A2	32	1034	19	35,56	114,89	15	PA	34,5	34,27	10	SI
RAIMONDO Fabio	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	5	BIO/04	05/A2	19	591	14	19	32,83	12	PA	14	24,45	8,5	SI
SORRENTI Luana	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	11	M-PSI/04	11/E2	7	9	2	7	0,6	2	PA	4	1,35	2	NO
GIOFRE Salvatore	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	3	CHIM/06	03/C1	39	280	10	43,33	31,11	13	PA	33	42,47	10	SI
											PO	41,5	55,45	12	

Valutazione Rinnovi Settembre - Ottobre 2016 - Ricercatori a tempo determinato settori non bibliometrici

Nome	Area	SSD	SC	Num. libri >= 2005	Num. Capitoli di libro e/o Articoli su riviste scientifiche >= 2005	Num. Articoli su riviste di fascia A >= 2005	Num. libri normalizzato	Num. Capitoli di libro e/o Articoli su riviste scientifiche normalizzato	Num. Articoli su riviste di fascia A normalizzato	Fascia Mediane	Mediana num. libri normalizzato	Mediana num. Capitoli di libro e/o Articoli su riviste scientifiche normalizzato	Mediana num. Articoli su riviste di fascia A normalizzato	Superamento una mediana
ARIZZI Cristina	10	L-LIN/12	10/L1	1	5	0	1,11	5,56	0	PA	1	12	1	SI
CARABETTA Stefano	12	IUS/02	12/E2	2	11	0	2,22	12,22	0	PA	2	11,5	2	SI
RUSSO Antonio	14	SPS/04	14/A2	5	17	2	7,14	24,29	2,86	PA	1,05	14	1	SI
MARCHESE Claudio	8	ICAR/14	08/D1	0	29	0	0	29	0	PA	2	15,5	2	SI
DE MARCO Santa	12	IUS/12	12/D2	1	20	5	1	20	5	PA	1	15	6	SI
ZAMPIERI Pier Paolo	14	SFS/10	14/D1	2	11	1	2,86	15,71	1,43	PA	2	12	2	SI
GRADI Marco	12	IUS/15	12/F1	2	43	11	2	43	11	PA	1	17	7	SI
CINICI Maria Cristina	13	SECS-PRO8	13/B2	2	14	1	2,22	15,56	1,11	PA	2	14	0	SI
										PO	2	15	0	SI

Nominativo	Titolo	Area	SSD	SC	Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali (2006-2016)	Num. Citazioni	H Index	Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali (2006-2016)	Num. Citazioni normalizzato	Fascia Mediale Hc	Mediana Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali normalizzato	Mediana Num. Citazioni normalizzato	Mediana Hc	Superamento due mediane	Num. Cit. SCOPUS	Num. Cit. ISI	Num. Cit. ISI	MAX Citazioni	Citazioni per hc	Anno	
																					PA
SORRENTI Luana	Riceratore a.t.d. (art. 1 comma 14 L. 230/05)	11	M-PSI/04	11/62	7	9	2	7	0,56	2	4	1,35 2,47	2 3	NO							
Prodotti censiti dalle banche dati ISI e/o SCOPUS																					
	2790166 - 14.a.1 Articolo su rivista Filippello P.; Harrington N.; Buzzi C.; Sorrenti L.; Costa S. (2014) The Relationship Between Frustration Intolerance, Unhealthy Emotions, and Assertive Behaviour in Italian Students - 0894-9085 JOURNAL OF RATIONAL-EMOTIVE AND COGNITIVE-BEHAVIOR THERAPY Vol. 32.3 pag. 1 - 22 10.1007/s10942-014-0195-4 - 000344621100003 2-52.0-84912103527												3	5		4		5	6.66666667	2014	
	3062234 - 14.a.1 Articolo su rivista Filippello, Pina; Sorrenti, Luana; Buzzi, Caterina; Costa, Sebastiano (2015) Perceived Parental Psychological Control and Learned Helplessness: The Role of School Self-Efficacy. - 1866-2625 SCHOOL MENTAL HEALTH Vol. 7.4 pag. 298 - 310 10.1007/s12131-015-9151-2 - 000365129200006 2-52.0-84944469273												2	2		4		4	4	8	2015
	1681191 - 14.a.6 Abstract in rivista SORRENTI L.; LARCAN R.; CUZZOCREA F.; OLIVA P. (2004) Influence of emotional aspects on academic performances - 0020-7594 INTERNATIONAL JOURNAL OF PSYCHOLOGY Vol. 39 pag. 136 - 136 28° International Congress of Psychology, Beijing - Cina 8-13 Agosto - WOS:000226118001235												2	0		3		3	0,923076923	2004	
	3062238 - 14.a.1 Articolo su rivista Filippello, Pina; Spadaro, Laura; Sorrenti, Luana; Mafolla, Antonia Viviana; Drammis, Letizia (2016) PROCESSI METACOGNITIVI E DI PIANIFICAZIONE IN BAMBINI CON DISORTOGRAFIA (Metacognitive Processes and Planning in Children with Dysorthography). - 1824-078X PSICOLOGIA CLINICA DELLO SVILUPPO I pag. 83 - 102 10.14498131 - 00079423300004 2-52.0-8496546456												0	0			1	1	4	4	2016
	3062231 - 14.a.1 Articolo su rivista Luana, Sorrenti; Pina, Filippello; Caterina, Buzzi; Sebastiano, Costa (2015) Tolleranza alla frustrazione e benessere psicologico: quale relazione? - 1721-0321 PSICOLOGIA DELLA SALUTE 3 pag. 65 - 86 10.3280/PDS2015-003004 - 2-52.0-84948461544												0	0			1	1	2	2	2015
	3062236 - 14.a.1 Articolo su rivista Sorrenti, Luana; Filippello, Pina; Costa, Sebastiano; Buzzi, Caterina (2015) A psychometric examination of the Learned Helplessness Questionnaire in a sample of Italian school students. - 0033-3085 PSYCHOLOGY IN THE SCHOOLS Vol. 52.9 pag. 923 - 941 10.1002/pits.21867 - 000362684700007 2-52.0-84943224432												0	0			1	1	2	2	2015
	3061722 - 14.a.1 Articolo su rivista Filippello, Pina; Marino, Flavia; Chià, Paola; Sorrenti, Luana (2015) Attachment and social behavior in children: autistic disorders. - 2035-5963 LIFE SPAN AND DISABILITY Vol. 18.1 pag. 101 - 118 - 2-52.0-84936943894												0	0				0	0	0	2015
	1979421 - 14.a.3 Contributi in esteso in Atti di convegno Cavallari B.; Finara G.; Merzatteta E.; Sorrenti L.; Cucinotta C.; Nicolina A. (2012) Gender Differences to promote social policies of prevention. - pag. 181 - 184 9788875876401 ?Differenze di genere e salute mentale?, Atti della Conferenza Tematica Nazionale della Società Italiana di Psichiatria MEDIMOND - Monduzi Editore - International Proceedings Division Bologna Differenze di genere e salute mentale Cagliari 20-22 Ottobre 2011 - 000310360106031												0	0				0	0	0	2012
	1681190 - 14.a.6 Abstract in rivista OLIVA P.; LARCAN R.; CUZZOCREA F.; SORRENTI L. (2004) The role of reading purpose on comprehension and inference generation - 0020-7594 INTERNATIONAL JOURNAL OF PSYCHOLOGY Vol. 39 pag. 57 - 58 28° International Congress of Psychology, Beijing ? Cina 8-13 Agosto - WOS:000226118000523												0	0				0	0	0	2004
	Filippello, P., Sorrenti, L., Buzzi, C., Costa, S. (in press). L'Almost Perfect Scale-Revised: un contributo all'adattamento italiano. <i>Giornale Italiano di Psicologia</i> . <i>Rivista indicizzata SCOPUS</i> . ISSN: 0390-5349													0							2016
	Sorrenti, L., Filippello, P., Buzzi, C., Sorrenti, L., Sorrenti, L., Sorrenti, L. (2016). Learned Helplessness and Learning Goals: Role played in School Refusal. A Study on Italian Students. <i>Mediterranean Journal of Clinical Psychology</i> . 4(2). Doi: 10.6092/22821619/2016.4.1235. (La rivista in incates non è presente, nel 2015 ma alcuni lavori del 2015 sono stati censiti da web of science)												0	0							2016
	Pina Filippello, Valentina Tassone, Laura Spadaro e Luana Sorrenti dal titolo "Comparison of the effectiveness of comprehension and meta-comprehension: intervention programs in poor comprehenders" è stato accettato e verrà pubblicato nel vol. 19 n. 2 / 2016 della rivista Life-Span and Disability (www.lifespan.it).																				

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**Giuseppe Bonanno**

**Da:** Luana Sorrenti [sorrenti@unime.it]  
**Inviato:** venerdì 16 settembre 2016 12:47  
**A:** Settore Ricerca Scientifica  
**Oggetto:** Re: Calcolo indicatori DM. 76  
**Allegati:** Attestazione Filippello.pdf; Manuscript Poor comprehenders.pdf

Gent.mo Ing. Bonanno,  
le invio la lettera di accettazione del lavoro in stampa e il relativo PDF.  
In attesa di un suo cortese riscontro, le invio cordiali saluti.

Luana Sorrenti  
Ricercatore in Psicologia dello sviluppo e dell'educazione  
Dipartimento di Scienze Cognitive, Psicologiche Pedagogiche e Studi Culturali  
Università degli Studi di Messina

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**Da:** "Settore Ricerca Scientifica" <ricerca@unime.it>  
**A:** "Luana Sorrenti" <sorrenti@unime.it>  
**Inviato:** Venerdì, 16 settembre 2016 10:59:18  
**Oggetto:** R: Calcolo indicatori DM. 76

Gentile Dott.ssa Sorrenti,  
purtroppo i telefoni funzionano male, può contattarmi al numero cellulare 3333548884.  
L'articolo di cui parla su quale rivista sarà pubblicato ?

In attesa di un Suo riscontro porgo

cordiali saluti

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Ing. Giuseppe Bonanno  
Responsabile Unità Organizzativa "Ricerca Scientifica"  
Unità Speciale "Ricerca Scientifica e Internazionalizzazione"  
Università degli Studi di Messina  
Via Consolato del Mare, 41 - Palazzo Mariani  
98122 Messina  
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Al sensi del T.U. Privacy (D.Lgs.196/03) si precisa che le informazioni contenute in questo messaggio sono riservate e ad uso esclusivo del destinatario in relazione alle finalità per le quali è stato ricevuto. Qualora il messaggio in parola le fosse pervenuto per errore, La preghiamo di eliminarlo senza copiarlo e di non inoltrarlo a terzi, dandocene gentilmente comunicazione. Grazie

**Da:** Luana Sorrenti [mailto:sorrenti@unime.it]  
**Inviato:** venerdì 16 settembre 2016 10:28  
**A:** Settore Ricerca Scientifica  
**Oggetto:** Re: Calcolo indicatori DM. 76  
**Priorità:** Alta

3062236 - 14.a.1 Articolo su rivista Sorrenti, Luana; Filippello, Pina; Costa, Sebastiano; Buzzai, Caterina (2015) A psychometric examination of the Learned Helplessness Questionnaire in a sample of Italian school students. - 0033-3085 PSYCHOLOGY IN THE SCHOOLS Vol. 52 9 pag. 923 - 941 10.1002/pits.21867 - 000362684700007 2-s2.0-84943224432	0	0
3061722 - 14.a.1 Articolo su rivista Filippello, Pina; Marino, Flavia; Chilà, Paola; Sorrenti, Luana (2015) Attachment and social behavior in children's autistic disorders. - 2035-5963 LIFE SPAN AND DISABILITY Vol. 18 1 pag. 101 - 118 - 2-s2.0-84936943894	0	0
1979421 - 14.d.3 Contributi in extenso in Atti di convegno Cavallari B. ; Fanara G.; Mezzaeta E.; Sorrenti L.; Cucinotta C.; Nicotina A. (2012) Gender Differences to promote social policies of prevention. - pag. 181 - 184 9788875876401 ?Differenze di genere e salute mentale?, Atti della Conferenza Tematica Nazionale della Società Italiana di Psichiatria MEDIMOND- Monduzzi Editore - International Proceedings Division Bologna Differenze di genere e salute mentale Cagliari 20-22 Ottobre 2011 - 000310360100031	0	0
1681190 - 14.a.6 Abstract in rivista OLIVA P; LARCAN R; CUZZOCREA F.; SORRENTI L. (2004) The role of reading purpose on comprehension and inference generation - 0020-7594 INTERNATIONAL JOURNAL OF PSYCHOLOGY Vol. 39 pag. 57 - 58 28° International Congress of Psychology Beijing ? Cina 8-13 Agosto - WOS:000226118000523	0	0

Periodo 2005 - 2015 :

Nominativo	Ruolo	Area SSD	SC	Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali	Num. Citazioni	H Index	Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali normalizzato	Num. Citazioni normalizzato	Fascia Mediane Hc	Mediana Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali normalizzato	Mediana Num. Citazioni normalizzato	Mediana Hc	Superamento due mediane	
SORRENTI Luana	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	M-PSI/04	11/E2	7	9	2	7,00	0,60	2	PA PO	4,00 7,00	1,35 2,47	2,00 3,00	NO
Prodotti censiti dalle banche dati ISI e/o SCOPUS														
2790168 - 14.a.1 Articolo su rivista Filippello P; Harrington N; Buzzai C; Sorrenti L; Costa S (2014) The Relationship Between Frustration Intolerance, Unhealthy Emotions, and Assertive Behaviour in Italian Students - 0894-9085 JOURNAL OF RATIONAL-EMOTIVE AND COGNITIVE-BEHAVIOR THERAPY Vol. 32 3 pag. 1 - 22 10.1007/s10942-014-0193-4 - 000344621100003 2-s2.0-84912103527														
3062234 - 14.a.1 Articolo su rivista Filippello, Pina; Sorrenti, Luana; Buzzai, Caterina; Costa, Sebastiano (2015) Perceived Parental Psychological Control and Learned Helplessness: The Role of School Self-Efficacy. - 1866-2625 SCHOOL MENTAL HEALTH Vol. 7 4 pag. 298 - 310 10.1007/s12310-015-9151-2 - 000365129200006 2-s2.0-84944469273														
1681191 - 14.a.6 Abstract in rivista SORRENTI L; LARCAN R; CUZZOCREA F.; OLIVA P (2004) Influence of emotional aspects on academic performances - 0020-7594 INTERNATIONAL JOURNAL OF PSYCHOLOGY Vol. 39 pag. 136 - 136 28° International Congress of Psychology Beijing - Cina 8-13 Agosto - WOS:000226118001235														
3062238 - 14.a.1 Articolo su rivista Filippello, Pina; Spadaro, Laura; Sorrenti, Luana; Mafodda, Antonina Viviana; Drammis, Letizia (2016) PROCESSI METACOGNITIVI E DI PIANIFICAZIONE IN BAMBINI CON DISORTOGRAFIA (Metacognitive Processes and Planning in Children with Dysorthography). - 1824-078X PSICOLOGIA CLINICA DELLO SVILUPPO 1 pag. 83 - 102 10.1449/83131 - 000379423300004 2-s2.0-84966546456														
3062231 - 14.a.1 Articolo su rivista Luana, Sorrenti; Pina, Filippello; Caterina, Buzzai; Sebastiano, Costa (2015) Tolleranza alla frustrazione e benessere psicologico: quale relazione? - 1721-0321 PSICOLOGIA DELLA SALUTE 3 pag. 65 - 86 10.3280/PDS2015-003004 - 2-s2.0-84948461544														
3062236 - 14.a.1 Articolo su rivista Sorrenti, Luana; Filippello, Pina; Costa, Sebastiano; Buzzai, Caterina (2015) A psychometric examination of the Learned Helplessness Questionnaire in a sample of Italian school students. - 0033-3085 PSYCHOLOGY IN THE SCHOOLS Vol. 52 9 pag. 923 - 941 10.1002/pits.21867 - 000362684700007 2-s2.0-84943224432														
3061722 - 14.a.1 Articolo su rivista Filippello, Pina; Marino, Flavia; Chilà, Paola; Sorrenti, Luana (2015) Attachment and social behavior in children's autistic disorders. - 2035-5963 LIFE SPAN AND DISABILITY Vol. 18 1 pag. 101 - 118 - 2-s2.0-84936943894														
1979421 - 14.d.3 Contributi in extenso in Atti di convegno Cavallari B. ; Fanara G.; Mezzaeta E.; Sorrenti L.; Cucinotta C.; Nicotina A. (2012) Gender Differences to promote social policies of prevention. - pag. 181 - 184 9788875876401 ?Differenze di genere e salute mentale?, Atti della Conferenza Tematica Nazionale della Società Italiana di Psichiatria MEDIMOND- Monduzzi Editore - International Proceedings Division Bologna Differenze di genere e salute mentale Cagliari 20-22 Ottobre 2011 - 000310360100031														
1681190 - 14.a.6 Abstract in rivista OLIVA P; LARCAN R; CUZZOCREA F.; SORRENTI L. (2004) The role of reading purpose on comprehension and inference generation - 0020-7594														

Gent.mo Ing. Bonanno,  
 provo a chiamarla per telefono ma risulta staccato. Forse riuscirò a breve ad ottenere una lettera dall'editore di conferma che un mio articolo uscirà a dicembre...qui c'è una citazione del 2016 che mi permetterebbe di innalzare l'h index...spero di farle avere il tutto entro le ore 13...  
 Potrebbe gentilmente fornirmi un altro recapito telefonico?  
 Grazie

Luana Sorrenti  
 Ricercatore in Psicologia dello sviluppo e dell'educazione  
 Dipartimento di Scienze Cognitive, Psicologiche Pedagogiche e Studi Culturali  
 Università degli Studi di Messina

**Da:** "Settore Ricerca Scientifica" <[ricerca@unime.it](mailto:ricerca@unime.it)>  
**A:** "Luana Sorrenti" <[sorrenti@unime.it](mailto:sorrenti@unime.it)>, "Luana sorrenti" <[luana.sorrenti@unime.it](mailto:luana.sorrenti@unime.it)>  
**Inviato:** Martedì, 13 settembre 2016 12:02:27  
**Oggetto:** Calcolo indicatori DM: 76

Gentile Dott.ssa Sorrenti,

inviavo i dati relativi agli indicatori DM: 76 calcolati considerando i dati da Lei inseriti su IRIS:

Periodo 2006 - 2016

Nominativo	Ruolo	Area SSD	SC	Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali	Num. Citazioni	H Index	Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali normalizzato	Num. Citazioni normalizzato	Fascia Mediane Hc	Mediana Numero di articoli degli ultimi 10 anni presenti nelle banche dati internazionali normalizzato	Mediana Num. Citazioni normalizzato	Mediana Hc	Superamento due mediane
SORRENTI Luana	Ricercatore a t.d. (art.1 comma 14 L. 230/05)	11	M-11/E2 PSI/04	7	9	2	7,00	0,56	2	4,00	1,35	2,00	NO
Prodotti censiti dalle banche dati ISI e/o SCOPUS													
2790168 - 14.a.1 Articolo su rivista Filippello P; Harrington N; Buzzai C; Sorrenti L; Costa S (2014) The Relationship Between Frustration Intolerance, Unhealthy Emotions, and Assertive Behaviour in Italian Students - 0894-9085 JOURNAL OF RATIONAL-EMOTIVE AND COGNITIVE-BEHAVIOR THERAPY Vol. 32 3 pag. 1 - 22 10.1007/s10942-014-0193-4 - 000344621100003 2-s2.0-84912103527													
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Cordiali saluti

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Ing. Giuseppe Bonanno

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# LIFE SPAN AND DISABILITY

## An Interdisciplinary Journal

Troina, 15/09/16

All'attenzione degli autori Pina Filippello, Valentina Tassone, Laura Spadaro, Luana Sorrenti.

**OGGETTO: Attestazione di pubblicazione in corso**

Si attesta che il contributo di Pina Filippello, Valentina Tassone, Laura Spadaro e Luana Sorrenti dal titolo "Comparison of the effectiveness of comprehension and meta-comprehension: intervention programs in poor comprehenders" è stato accettato e verrà pubblicato nel vol. 19 n. 2 / 2016 della rivista Life Span and Disability ([www.lifespan.it](http://www.lifespan.it)).

Il Direttore Responsabile

Dott. Serafino Buono



## **Comparison of the effectiveness of comprehension and meta-comprehension intervention programs in poor comprehenders**

### **Abstract**

*Both comprehension training (CT) and metacomprehension training (MT) have been shown to be effective in improving reading comprehension in poor comprehenders but there has been no comparative analysis of their efficacy. This study compared CT and MT with the objective of verifying their effectiveness in improving comprehension skills and determining which program produces the better results. Thirty elementary school students (average age = 9.35 year) and 30 middle school students (average age = 12.63 years) with deficits in reading comprehension and metacomprehension skills were assigned to three experimental conditions: CT, MT and a control condition (C). Both training programs improved comprehension relative to the control group in both age groups, but MT was more effective than CT. Training in both cognitive skills and the metacognitive skills underlying reading comprehension is the most effective way of improving reading in readers with poor comprehension.*

**Keywords:** Comprehension training; Metacomprehension training; Metacognitive awareness; Poor comprehenders; Educational implications.

### **1. Introduction**

Academic difficulties are not a new theme for scientific research and surveying research in this area reveals a certain predilection for research focused on difficulties arising primarily from a deficit in reading or writing. Little attention has been given to reading comprehension.

Reading comprehension is a process with multiple components and therefore a range of different approaches have been assessed. Comprehension depends on several cognitive processes, including the ability to represent the content of a text due through use of working memory and attentive processes (Van den Broek *et al.*, 2005). Comprehension requires the ability to gather the most important information from a text whilst ignoring or discarding irrelevant intrusions (Perfetti, & Hogaboam, 1975), to activate inferential processes in order to compensate for parts of the text which are not related or not actually present (Cain, & Oakhill, 2006; Van den Broek,

1994), to comprehend the structure of a text and its logical connections, or more specifically, the spatial temporal elements (Meneghetti, De Beni, & Cornoldi, 2007) and to activate control processes and metacognitive knowledge (De Beni, & Pazzaglia, 1990). The aim of this research, which draws on the theory expounded in *Simple View of Reading* (Gough, & Tunmer, 1986) and subsequent related studies (Bishop, & Snowling, 2004) was to confirm the importance of in-depth assessment of cognitive processes involved in comprehension which can then be used to inform development of effective, specific remedial interventions. It is probable that subjects with similar comprehension problems differ in terms of metacognitive skills, i.e. their knowledge of mental functioning and self-monitoring (Brown, Brandsford, Ferrara, & Campione, 1983; Cornoldi, 1995; Flavell, 1981; Kuhn, 2000). In fact, metacognition implies monitoring, interpretation, evaluation and regulation of their cognitive processes (Quattropiani, Lenzo, Mucciardi, & Toffle, 2015).

Many researchers have investigated the relationship between comprehension and metacognitive skills (Boulware-Gooden, Carreker, Thornhill, & Joshi, 2007; De Beni, & Pazzaglia, 1990; Dunlosky, & Lipko, 2007; Lonciari, Melon, Torchetti, Bravar, & Carozzi, 2008; McKeown, Beck, & Blake, 2009; Michalsky, Mevarech, & Haibi, 2009; Pazzaglia, & Rizzato, 2001; Pedron, Micheletto, Tressoldi, & Lucangeli, 2009; Rosiglioni, & Dal Santo 2010) and numerous studies have attempted to characterize the typical poor comprehender and obtain insight into how comprehension problems might be tackled (Cain, & Oakhill, 2006; Carretti, Cornoldi, & De Beni, 2002, 2007; Catts, Adlof, & Weismer, 2006; Nation, Clarke, Marshall, & Durand, 2004; Padovani, 2006). Given that comprehension problems can result in a variety of deficits, as outlined above, an intervention which targets all the main areas of deficiency is required.

*Poor comprehenders* are children with specific reading comprehension difficulties: they are able to read accurately, but have poor understanding of what they read (Clarke, Snowling, Truelove, & Hulme, 2010; Duff, & Clarke, 2011). As one would expect, comprehension difficulties may be limited to the level of individual words or the connections between sentences, or extend to paragraph level (Kurlowicz, & Tuffanelli, 2007; Padovani, 2006; Tressoldi, & Zamperlin, 2007; Tuffanelli, 2009).

Poor comprehenders, unlike poor decoders, do not have problems with phonological processing (Catts *et al.*, 2006; Nation, Cocksey, Taylor, & Bishop, 2010). Clarke and coll. (2010)

demonstrated that decoding ability is only important to comprehension in the early stages of learning to read; as children grow older decoding becomes automatic and oral comprehension becomes the most important predictor of ability to comprehend text. Keenan and coll. (2008) argued that decoding is fundamental to comprehension, and that because it is easier to define decoding failures than comprehension failures, decoding problems are easier to deal with than comprehension deficits. Unlike decoding ability, which can be easily and accurately assessed in the school environment, difficulties with comprehension often remain hidden. Nation and Angell (2006) noted that teachers often fail to spot comprehension difficulties.

Edmonds and coll. (2009, p. 274), noted that “*there may be a diminishing relationship between accuracy (e.g., word recognition and fluent reading) and comprehension. Word-level interventions are associated with small to moderate effects on comprehension*”. In fact research (Allinder, Dunse, Brunken, & Obermiller-Krolikowski, 2001; Kuhn, & Stahl, 2003) has shown that improvements in reading rate and accuracy are not always associated with improved comprehension. This demonstrates that although the two skills are related (correct decoding plays a part in comprehension, and likewise good comprehension accelerates decoding) they involve different cognitive processes (Keenan *et al.*, 2008; Kendeou, van den Broek, White, & Lynch, 2009; Nation, & Angell, 2006).

Interesting evidence on this issue was provided by longitudinal research on readers with poor comprehension skills, which found no clear deficits in phonological awareness tasks, thus confirming that problems with comprehension are not primarily due to a decoding impairment. Instead deficits were found on non-phonological linguistic tasks such semantic inference, syntactic cognition and listening comprehension (Van den Broek *et al.*, 2005).

Poor comprehenders will benefit most from reading interventions which target comprehension - for example instruction focused directly on comprehension strategies, such as modeling and thinking aloud about how to self-question and how to reflect during and after reading - as well as from becoming actively involved in monitoring their understanding and in processing text meaning (Bråten, & Anmarkrud, 2013; Edmonds *et al.*, 2009). Poor comprehenders lack the vocabulary and metacognitive skills needed to monitor their understanding and reflect on what they have read (Boulware-Gooden *et al.*, 2007). Direct teaching of multiple reading strategies is an effective method of enhancing reading comprehension (Spörer, Brunstein, & Kieschke, 2009).

De Beni and Pazzaglia (1990) were among the first (followed by others, e. g. McKeown *et al.*, 2009; Meneghetti *et al.*, 2007) to demonstrate that remedial training in reading comprehension can and must act on all the cognitive components involved in comprehension (ability to process the structure and characteristics of the text; ability to recognize critical information; ability to recognize inferences; activation of relevant knowledge; ability to order events logically etc.), but they have also demonstrated that the most effective interventions are not limited to these activities. In fact, to maximize the effectiveness of an intervention it is important to focus on the metacognitive competence of the reader. The most effective training programs promote metacognitive knowledge of reading objectives, the existence of different reading strategies and the need to use these strategies flexibly according to the difficulty of the text and the reading objective, trying to individualize errors and incongruence present in the text and to verify the acquisition of content or the necessity to proceed to new reading of the same material (Whitebread, 2011). Most research on reading programs (Boulware-Gooden *et al.*, 2007; McKeown *et al.*, 2009; Michalsky *et al.*, 2009; Spörer *et al.*, 2009) has focused on these two components of metacognition and on developing effective, flexible study strategies in which can be used independently by readers. The effectiveness of the strategies often depends heavily on factors such as reader age and task complexity.

Most research in primary school children has been directed at the cognitive skills underlying text comprehension (processing information about characters, places, times, events, logical sequences, chronological factors etc.) but it is also important to evaluate the role of metacognitive processes (Florit, Levorato, & Roch, 2008).

Another study (Schisler, Joseph, Konrad, & Alber-Morgan, 2010) highlighted the importance of metacognitive skills to understanding of text. This study compared the effects of oral retelling, written retelling and passage review strategies on third grade students' accuracy and speed on a reading comprehension task. It was found that oral retelling coupled with repeated readings and phrase drill error correction was the most effective method of promoting accurate comprehension.

An effective study strategy training program should lead to more effective use of study time and hence greater academic achievement. Duff and Clarke (2011, p. 8) also asserted that "*interventions in this area should be more explicit (more skills, taught more directly), more intense (more learning opportunities provided, smaller teaching groups) and more supportive (academically, via scaffolded learning, and emotionally)*". Other researchers (Borkowski, &

Muthurishna, 2011; Brooks, 2007; Torgerson, Brooks, & Hall, 2006) have suggested that interventions should supplement, not replace, regular classroom literacy instruction. It is now agreed that pedagogical strategies which place more emphasis on developing the cognitive and metacognitive skills underlying reading comprehension will help to promote comprehension.

The difficulties related to text comprehension occur in older children relate to levels of a more complex linguistic elaboration which concern inferential reasoning, monitoring of comprehension, use of context and knowledge and use of the narrative structure of a text. Consequently most research on text comprehension in children up to the age of ten looks at cognitive processes, whereas research on text comprehension in older children concentrates on metacognitive competence (McCallum et al., 2011). Previous research on comprehension in older children includes an intervention study which examined the effectiveness of two programs designed to improve the reading comprehension of at-risk high school students. Participants in this study were divided into three groups: two experimental conditions and one control. The results showed that the metacognitive training program produced significant improvements in understanding of text (Padovani, 2006; Filippello, Spadaro, Sorrenti, Mafodda, & Drammis, 2016).

Since it is difficult to find research in the literature that compares the two types of intervention, the aim of this study was to investigate whether metacognitive training, targeted to develop cognitive and process control skills, can have a greater effect on poor comprehenders than comprehension training.

There is proposed to assess the effectiveness of two kinds of reading comprehension training program in two groups of children with comprehension deficits (9–11 year-olds and 12–13 year-olds). The choice of age groups was dictated by the desire to compare subjects with different levels of education; it was not practical to include children under the age of 9 as the research objectives included assessment of metacognition which is only beginning to emerge in children of this age (Pazzaglia, De Beni, & Cristante, 1994). Even children aged 9–11 years old are usually excluded from this type of research.

The second aim of the research was to investigate the relative effectiveness of two different intervention programs in producing improvements in the deficiencies assessed (Rosiglioni, & Dal Santo, 2010). More specifically, the aim of this study was to investigate whether a MT

program targeting cognitive and monitoring skills, would produce a greater improvement in the reading comprehension of poor comprehenders than CT.

If comprehension deficits are primarily due to impairments in specific semantic processes (recognizing the main characters, identifying the important information, grasping the logical temporal or spatial structure of events etc.), then CT should produce significant improvements in the sphere of reading comprehension. If deficits are instead determined by the metacognitive processes underlying comprehension, then MT - including stimulation of reflection, development of mindfulness and metacognitive skills and on use of thoughtful strategies and control mechanisms – should lead to improvements in metacognitive skills and hence have a positive effect on reading comprehensions.

## **2. Methods**

### *2.1. Participants*

We test 451 potential participants aged between 9-11 years and 476 potential participants aged 12-13 years in order to select children who met DSM-V-TR criteria (American Psychiatric Association, 2014) for normal intelligence and adequate decoding skills but had deficits in comprehension and metacomprehension ability. All participants were individually assessed using the tools described below.

The use of multiple eligibility criteria greatly reduced the number of participants. The majority of potential participants met the main eligibility criteria (IQ in the normal range; metacognitive deficit) but also demonstrated decoding deficits as well as comprehension deficits and thus had to be excluded. All students selected to participate had good decoding skills.

The sample consisted of two groups of 60 poor comprehenders, all of an average socio-cultural level. Participants were drawn from three different schools and there were equal numbers of boys and girls in each age group. The average age for the young group was 9.35 years ( $SD = 0.52$ ; range: 9–11 years old) and the average age in the older group was 12.63 years ( $SD = 0.49$ ; range: 12–13 years old).

Participants in the two groups were randomly assigned to one of three experimental conditions, CT, MT or control (C). Participants in the CT and MT conditions received specific



training in comprehension or metacomprehension skills, whilst participants in the C condition followed the standard Italian language curriculum.

The homogeneity of participant in the various experimental conditions in terms of reading skills, reading comprehension and understanding of goals was evaluated using simple comparisons. Table 1 summarizes the results of the simple comparisons and shows that there were no significant differences between participants in the three experimental conditions on the tests administered during the pre-training (selection) phase.

Table 1 near here

## 2.2. *Measures and Procedure*

*General intellectual functioning* was assessed using Raven's matrices (Raven, 1947). All the students had adequate general intellectual functioning (IQ score between 90 and 105;  $M= 96.83$ ;  $SD= 5.67$ ).

*Decoding skills* were assessed using the MT Reading Tests for elementary schools and junior schools (Cornoldi, & Colpo, 1995, 1998). This tool provides a reading profile based on the relationship between reading speed and reading accuracy scores.

*Reading comprehension* was assessed using the MT Comprehension Tests for primary schools and middle schools (Cornoldi, & Colpo, 1995, 1998). These tests require the student to read a passage and then answer a series of multiple-choice questions. Responses are used to establish the student's comprehension level. Only students who obtained a score at least 2 SD below the relevant age were included in this research.

*Metacognitive competence* was assessed using the Metacomprehension Test (Pazzaglia *et al.*, 1994) a widely-used tool for the detailed testing of both metacognitive knowledge and monitoring ability. As with the comprehension test, this metacognition test allows students to be assigned to one of five performance categories: standard achieved, good level, sufficient, insufficient or seriously insufficient. Participants included in the sample had "seriously insufficient" and "insufficient" metacognitive skills.

### 2.3. Training

The tool developed by De Beni and coll. (2003) for students of 9–11 years and 12–13 years old was used in both intervention conditions. However, the main interest in this study was in metacognitive factors related to the understanding of text and the use of a multi-component approach to skill training, even in children as young as 9 to 11 years, a period in which metacomprehension has been little studied.

Because we wanted to compare the two training programs (CT; MT) in both age groups (9–11 years; 12–13 years old) we attempted to keep the overall number of activities in each training domain similar, so that differences between programs could not be attributed to differences in scheduling.

Ten fundamental skills which support comprehension were identified; these were organized into three categories (content, elaboration and metacognition). The first two categories were the subject of the CT program, whilst the third was the main focus of the MT program. The 10 fundamental skills included in the training programs for both age groups are described in table 2.

Table 2 near here

The structure of training sessions was similar in the CT and MT programs. During the first segment material from the preceding session was briefly reviewed; this was followed by a second, clearly defined segment dedicated to a new activity. Activity cards described in table 2 were made available to participants, so each student could study the new material and use the new work methods flexibly, according to the activity and the type of work required. This had the advantage of ensuring that students were directly involved in their own learning and made use of self-correction, which proved a highly effective method of making the students aware of their own mistakes and conscious of their own ability to correct themselves and thus learn from mistakes. Each training session concluded with the students writing brief answers, based on their personal experience, to two simple questions: ‘What did I learn today?’ and ‘What difficulties did I encounter?’ These questions prompted students to reflect on the activities of the session and demonstrate their awareness of the problems they had encountered.

Training took place during school hours under the direction of an education psychologist and the poor comprehenders were divided into age groups for training. Because the participants in the MT and CT conditions were following a difference schedule the training sessions did not take place in their normal classrooms. Every training activity was supported by an activity card and all the children were provided with one card at a time. The psychologist described the activity and asked the children to complete the task. The group only moved onto the next activity when all of the children had completed the exercise. Students in both intervention conditions followed similar schedule, with 2 two-hour training sessions per week for five weeks.

Students in the C condition followed the normal school curriculum for the Italian language, which is based on theories and methods that do not provide specific training for poor comprehenders.

### **3. Data Analysis**

The Statistical Package for the Social Sciences (SPSS 17) was used to analyze the data. As the data were expressed as frequencies they were arcsine-transformed according to the formula provided by Freeman and Tukey (1950). Separate multivariate analyses of variance were conducted for the two age groups. *T*-tests were used to verify group differences in simple comparisons between pre- and post-training assessments.

### **4. Results**

Table 3 shows pre- and post-training means and standard deviations for the three experimental conditions, with respect to measures of comprehension, metacomprehension, accuracy and speed of reading.

Table 3 near here

#### *4.1. Reading Comprehension*

In both age groups there was a significant difference between pre- and post-training comprehension scores among the three groups (MT, CT, C) [9-11 years old:  $F(4,52)= 16.10$ ;

$p < .001$ ;  $\eta^2 = .553$ ; 12-13 years old:  $F(4,52) = 6.92$ ;  $p < .001$ ;  $\eta^2 = .347$ ]. These results confirmed that the differences between pre- and post-training assessments were not due to variance in the individual characteristics of participants but rather to the training programs. In the younger group, students in the CT [ $t(9) = -4.17$ ;  $p = .002$ ;  $d = -1.77$ ] or MT [ $t(9) = -14.97$ ;  $p = .000$ ;  $d = -5.58$ ] conditions had better comprehension skills after training. In the C condition there was no difference in comprehension in the pre- and post-training assessments [ $t(9) = -1.49$ ;  $p = .169$ ;  $d = -0.49$ ].

In post-training phases, younger that followed one of trainings [comprehension training:  $t(18) = 3.47$ ;  $p = .003$ ;  $d = 1.51$ ; metacognitive training  $t(18) = 10.99$ ;  $p = .000$ ;  $d = 4.80$ ] reported higher scores in their comprehension skills. However, younger students seem to have obtained the better results with the metacognitive training comparing their comprehension skills after the comprehension training [ $t(18) = -10.02$ ;  $p = .000$ ;  $d = -4.35$ ].

The pattern of results was similar in the older children. Students who had taken part in the CT [ $t(9) = -4.58$ ;  $p = .001$ ;  $d = -1.33$ ] or MT programs [ $t(9) = -9.458$ ;  $p = .000$ ;  $d = -3.95$ ] had better comprehension compared to pre-training. The C did not present any statistical differences between pre and post-training [ $t(9) = .13$ ;  $p = .897$ ;  $d = 0.09$ ]. The comparisons between CT [ $t(18) = 2.09$ ;  $p = .05$ ;  $d = 0.92$ ], MT [ $t(18) = 7.98$ ;  $p = .000$ ;  $d = 3.54$ ] with C demonstrate the effectiveness of both trainings. Even in the older group, the MT program seemed to be more effective in improving comprehension skills than the CT program [ $t(18) = -7.26$ ;  $p = .000$ ;  $d = -3.33$ ].

#### 4.2. *Metacomprehension*

The measure of metacomprehension also achieved similar statistical significance in the pre and post metacomprehension tests among the 9-11 age groups [ $F(4,52) = 13.48$ ;  $p < .001$ ;  $\eta^2 = .509$ ] and the 12-13 age groups [ $F(4,52) = 2.55$ ;  $p < .001$ ;  $\eta^2 = .164$ ]. Students of 9-11 years in the MT [ $t(9) = -36.257$ ;  $p = .000$ ;  $d = -3.98$ ] and CT [ $t(9) = -11.350$ ;  $p = .000$ ;  $d = -1.13$ ] conditions had higher scores on all measures at the post-training assessment compared with the pre-trained assessment. There was no significant difference in metacomprehension skills between the pre- and post-training scores in students in the C condition [ $t(9) = -1.38$ ;  $p = .20$ ;  $d = -0.14$ ]. The analysis also demonstrated that post-training scores were higher in the MT condition than the

CT [ $t(18) = -6.86$ ;  $p = .000$ ;  $d = -3.07$ ] or C conditions [ $t(18) = 8.73$ ;  $p = .000$ ;  $d = 3.98$ ]. Post-training scores in the CT and C conditions were similar [ $t(18) = 1.914$ ;  $p = .072$ ;  $d = 0.83$ ].

Similarly, comparison of pre- and post-training scores in the older group also showed that both training programs had significant benefits [CT:  $t(9) = -10.97$ ;  $p = .000$ ;  $d = -1.09$ ; MT:  $t(9) = -8.22$ ;  $p = .000$ ;  $d = -1.6$ ], but the performance of participants in the C condition did not change significantly during the training phase [ $t(9) = -1.379$ ;  $p = .201$ ;  $d = -0.35$ ]. However, in the older group there was no evidence that the MT program was more effective, as post-training scores were similar in the MT and CT conditions [ $t(18) = -1.15$ ;  $p = .27$ ;  $d = -0.49$ ]. In the post-training assessment students in the MT condition performed significantly better than students in the C condition [ $t(18) = 3.1$ ;  $p = .006$ ;  $d = 1.31$ ]; there was no significant difference between the post-training performance of students in the CT and C conditions [ $t(18) = .83$ ;  $p = .42$ ;  $d = 0.35$ ].

## 5. Discussion

The main aim of this research was to assess the impact of two reading comprehension training programs in children aged 9–11 years and 12–13 years with comprehension and metacomprehension deficits. All participants who followed one of the two training programs showed an improvement in reading comprehension and metacomprehension skills after the training. In both age groups participant assigned to the CT or MT condition had better reading comprehension skills at the post-training assessment than participants assigned to the C condition.

At the pre-training assessment there were no differences between the experimental conditions in terms of comprehension and metacomprehension processes. At the post-training assessment participants of all ages in both intervention conditions performed better on the tests of comprehension and cognitive and monitoring skills than participants in the C condition. These results indicate that in the absence of specific training in skills related to reading comprehension – as in the C condition – reading comprehension ability does not improve significantly over 10 weeks in children in this age range.

The second aim of this study was to investigate whether MT, which targets cognitive and monitoring skills, had a greater beneficial effect on reading comprehension in poor comprehenders than CT. The results indicated that MT was more effective at improving reading

comprehension skills than CT in both age groups. As expected, the MT program was more effective than the CT program at improving cognitive and monitoring skills in younger students. In add, this results it was clearly confirmed by the fact that non differences in metacomprehension skills were found comparing students that followed the CT with C. In older students, however, the MT and CT programs were similarly effective at increasing cognitive and monitoring skills. However, separate comparisons between the two intervention conditions and the C condition indicated that only participants in the MT condition performed significantly better than C participants at the post-training assessment.

It appears that both interventions were similarly effective in the older age group. There may be no extra benefit from MT in the older group because by this age, students' reading strategy is not very susceptible to change because they have already automated a study method which does not take account of the importance of metacognitive processes. Our results confirmed that MT had a greater positive impact on reading comprehension than CT which, although it resulted in a significant improvement in performance during training, had a smaller beneficial effect than MT. In both age groups the performance of participants in the C condition changed little during the training phase. The MT program, but not the CT program, resulted in post-training performance that was significantly better than that of participants in the C condition. This confirmed that although specific training in metacognitive skills is a necessary and effective strategy for improving cognitive reflection, the benefits on comprehension can be achieved without a specially designed training program. Comparison of the two intervention programs indicated that MT was a more effective method of improving reading comprehension than training which only targeted the cognitive processes underlying reading comprehension.

The strong point of the presented work was the same level of reading comprehension in all participants, favoring the stimulation of reflection on the effects of targeted intervention programs, placed in comparison with one another.

The small number of participants in each condition means that generalization of these findings may not be warranted, however, we argue that these findings provide sufficient evidence to encourage the development of intervention programs which place more emphasis on stimulating cognitive and particularly metacognitive processes underlying reading comprehension, and that such programs would not only improve reading but would also, inevitably, promote metacognitive competence. In our case, opportunely structured metacognitive

treatment, as compared to training limited solely to the improvement of the main cognitive processes, develops comprehension and metacomprehension skills to a greater degree than a traditional educational program (Kangsepp, 2011).

In summary, our results suggest that students who received specific training in metacognitive skills learned to take a more active, more self-aware approach to reading comprehension tasks. They suggest that MT may have a wider role in learning environments. In particular, we hope that future research will assess the feasibility of integrating MT into the standard educational curriculum, and that MT will be offered to all students to improve their study skills (Borkowski, & Muthurishna, 2011). These results should encourage further investigation into the efficacy of similar interventions at higher educational levels, extending the research to include students who arrive at secondary school with serious reading difficulties and whose comprehension problems have been neglected or perhaps not addressed at all.

## **6. Conclusion and educational implications**

This innovative study makes an original contribution to the literature on reading interventions. Although there has been some research on interventions targeting comprehension deficits most studies have used training methods focusing exclusively on either cognitive or metacognitive skills rather than comparing them. There is increasing interest in assessing reading comprehension and understanding the processes underlying good comprehension as it is the final goal of reading and poor comprehension skills can lead to poor academic achievement (RAND, 2002).

Some teachers assume that students' reading comprehension skills will develop naturally, without the need for explicit instruction (Denton, & Fletcher, 2003). Their primary concern is therefore to ensure that the child is capable of reading well, and that reading performance is in line with age norms and educational level; ability to access the meaning of a text assumes secondary importance, almost as if there were a desire to eliminate a possible pedagogical complication that may be tackled later on, when the child has fully automated the process of learning. Many teachers assume that students who can read words accurately are also capable of understanding what they read and learning from a text simply through reading, so they rarely

teach students strategies for reading in a way that will maximize understanding of content (Edmonds *et al.*, 2009). We argue that reading instruction is not complete when students are able to decode words efficiently. Students may need additional instruction in techniques which will help them understand what they read (Boulware-Gooden *et al.*, 2007). To equate effective reading with accurate decoding of written text is to risk unwittingly transmitting a distorted view of reading, in which decoding takes precedence over searching for meaning. Many training programs developed for students with reading difficulties who require additional help seem to be based on the assumption that improving decoding will automatically lead to improvements in comprehension.

The results of this study, and previous intervention studies (De Beni *et al.*, 2003), provide information about how best to help poor comprehenders and should inform the design and development of new interventions and pedagogical techniques to improve reading comprehension in school-age children. Our results were consistent with an earlier study (Pazzaglia, & Rizzato, 2001), in showing that MT was with a more effective remedial technique for reading comprehension difficulties than training which only targeted cognitive processes underlying the acquisition of meaning from texts. Our findings suggest that promoting metacognitive skills, in other words training students to be more aware their minds work, will lead to a general improvement in school performance. As De Beni and Pazzaglia (1990, 1991) had pointed out that a reader, especially a less skilled reader, who is not aware that the goal of reading is first and foremost to understand the text will not bother to reflect and check his or her understanding. It is therefore important that schools commit to improving students' capacity to learn, since this seems to be one of the determining factors in successful academic performance (Boulware-Gooden *et al.*, 2007; Bråten, & Anmarkrud, 2013; Edmonds *et al.*, 2009; McKeown *et al.*, 2009; Meneghetti *et al.*, 2007; Pedron *et al.*, 2009; Rosiglioni, & Dal Santo, 2010). Teachers' social feedback plays a critical role in acquisition of metacognitive skills. Guided and systematic analysis of mistakes and successes offers an excellent opportunity to improve students' awareness of their strengths and weaknesses and encourage them to adopt an effective studying strategy based on metacognitive skills, which will help them to become independent learners (Andreassen, & Bråten, 2011; Logan, Medford, & Hughes, 2011; Michalsky *et al.*, 2009; Spörer *et al.*, 2009).

The reading-related skills which should receive most attention in teaching of reading and in remedial interventions are metacognitive skills (Pazzaglia *et al.*, 1994), particularly reflective



skills, namely awareness of the goal of reading (Why am I reading this text?), use of specific and appropriate reading strategies (How can I read in order to understand? Does this text require close reading or will skim-reading be sufficient?), use of textual indicators such as titles, graphics, illustrations (Does the text help me?) and the use of prior knowledge (What do I already know about the topic?). The positive impact of MT on learning suggests that teaching of metacognitive skills should begin early, perhaps with the simple exercises to develop students' awareness and control over the processes which underpin understanding of text.

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