

## **The Effect of Testing on Achievement: Meta-Analyses and Research Summary, 1910–2010**

### **Source List, Effect Sizes, and References for Quantitative Studies**

The text of this study will be published in the *International Journal of Testing*. The study summarizes the research literature on the effect of testing on student achievement, which comprises several hundred studies conducted from the early 20<sup>th</sup> century to the present day. Only quantitative studies are listed here (N studies = 177; N effects = 640). Mean effect sizes range from a moderate  $d \approx 0.55$  to a fairly large  $d \approx 0.88$  depending on the way effects are aggregated or effect sizes are adjusted for study artifacts. Testing with feedback produces the strongest positive effect on achievement. Adding stakes or testing with greater frequency also strongly and positively affects achievement. The evidence from a century's worth of quantitative studies shows the effect of testing on achievement to be moderately to strongly positive.

Smaller-scale studies, however, tend to produce stronger effects than do large-scale studies. Those who judge the effect of testing on achievement exclusively from large-sample multivariate studies deprive themselves of the most focused, clear, and precise evidence. Some prominent researchers in economics and education, for example, have claimed that no studies of “test-based accountability” had been conducted before theirs in the early 2000s. But, this list includes 24 studies completed before 2000 whose primary focus was to measure the effect of “test-based accountability.” A few dozen more pre-2000 studies also measured the effect of test-based accountability although such was not their primary focus. Include qualitative and program evaluation studies of test-based accountability, and the count of pre-2000 studies rises into the hundreds.

## THE EFFECT OF TESTING ON ACHIEVEMENT, QUANTITATIVE STUDIES

Author	Year of pub	Primary focus of study	Level of education	Sub-level of education	Location	Geo-graphic context	Unit of analysis	Effect size*
Gates, A.I.	1917	retention	elem-sec	lower secondary	US	n/a	student	0.65
Jones, E.H.	1923	retention	postsec	undergrad	US	campus	student	1.42
Shore, Miles Victor	1925	testing frequency	elem-sec	lower secondary	IA	n/a	student	0.28
Panlasigui, Isidoro	1928	mastery testing	elem-sec	primary	US	city	student	0.20
Deputy, E. C.	1929	testing frequency	postsec	undergrad	IN	campus	student	0.82
Maloney, E. L., & Ruch, G. M.	1929	testing frequency	elem-sec	lower secondary	CA	n/a	student	1.30
Turney, A. H.	1931	testing frequency	postsec	undergrad	US	campus	student	4.52
Kulp, D. H.	1933	testing frequency	postsec	graduate	US	campus	student	1.05
Keys, N.	1934	testing frequency	postsec	undergrad	CA	campus	student	0.36
Noll, V. H.	1939	retention	postsec	undergrad	RI	campus	student	-0.25
Ross, C.C., & Henry, L. K.	1939	testing frequency	postsec	undergrad	IA	campus	student	1.31
Sones, A. M., & Stroud, J. B.	1939	retention	elem-sec	lower secondary	IA	n/a	student	-0.26
Spitzer, Herbert F.	1939	retention	elem-sec	intermediate	IA	city	student	0.85
Fitch, Mildred L., Drucker, A. J., & Norton, J. A., Jr.	1951	testing frequency	postsec	undergrad	IN	campus	student	0.74
Mudgett, A. G.	1956	testing frequency	postsec	undergrad	MN	campus	student	0.20
Standlee, L.S., & Popham, W. J.	1960	testing frequency	postsec	undergrad	IN	campus	student	0.46

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Selakovich, D.	1962	testing frequency	postsec	undergrad	TX	campus	student	-0.10
Curo, D.M.	1963	testing frequency	elem-sec	upper secondary	IN	metro area	student	0.31
Laidlaw, W. J.	1963	testing frequency	postsec	undergrad	NJ	campus	student	-1.11
Denny, T., Paterson, J., & Feldhusen, J.	1964	testing frequency	postsec	undergrad	IN	campus	student	0.11
Sax, Gilbert, & Reade, Marybell	1964	practice test	postsec	undergrad	HA	campus	student	1.11
Stodola, Q.C., Eustice, D.E., & Kolstoe, R.H.	1964	testing frequency	postsec	undergrad	ND	campus	student	0.44
Pikunas & Mazzota	1965	testing frequency	elem-sec	upper secondary	MI	city	student	1.03
Rothkopf, Ernst Z.	1966	practice test	postsec	undergrad	NJ	campus	student	2.29
Wiggins, J. A.	1968	testing frequency	postsec	undergrad	NC	campus	student	1.30
Marso, R. N.	1970	mastery testing	postsec	undergrad	NE	campus	student	0.50
Donaldson, Wayne	1971	retention	postsec	undergrad	PA	campus	student	0.56
Hogan, Robert M. & Kintsch, Walter	1971	retention	postsec	undergrad	CO	campus	student	0.05
Lawler, R.M	1971	mastery testing	postsec	undergrad	FL	campus	student	1.37
Monk, J. J., & Stallings, W. M.	1971	testing frequency	postsec	undergrad	IL	campus	student	0.20
Block, J. H.	1972	mastery testing	elem-sec	lower secondary	OR	city	student	0.04

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Okey, J.R., Brown, J.L., & Fiel, R.L.	1972	testing frequency	postsec	undergrad	CA	campus	student	1.34
Weber, L., & Olsen, R. E.	1972	retention	postsec	graduate	IL	campus	student	0.20
Robinson, P.	1972	accountability	postsec	undergrad	UT	campus	student	0.22
Bostow, D.E. & O'Connor, R.J.	1973	mastery testing	postsec	undergrad	FL	campus	student	1.01
Shapiro, S. L.	1973	testing frequency	postsec	community postsec	NY	city	student	0.43
Sheldon, M.S., & Miller, E.D.	1973	mastery testing	postsec	community postsec	CA	campus	student	0.61
Wentling, T.L.	1973	mastery testing	elem-sec	upper secondary	IL	city	student	0.22
Calhoun, James F.	1973	mastery testing	postsec	undergrad	NY	campus	student	0.83
Martin, R.R., & Srikameswarant, Kam	1974	testing frequency & mastery testing	postsec	undergrad	Ontario	campus	student	0.27
Nation, J.R., Knight, J.M., Lamberth, J. & Dyck, D.G.	1974	mastery testing	postsec	undergrad	OK	campus	student	0.62
Okey, J.R.	1974	mastery testing	elem-sec	primary	IN	all	student	0.55
Semb, George	1974	mastery testing	postsec	undergrad	KS	campus	student	0.76
Hill, Mildred, et al.	1974	accountability	elem-sec	primary	VT	school district	student	0.28
Reith, H., et al.	1974	testing frequency	elem-sec	intermediate	KS	suburban	student	0.47
Honeycutt, J.K.	1974	mastery testing	postsec	undergrad	OH	campus	student	1.61

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Muha, Joseph F.	1974	mastery testing	postsec	community postsec	CA	campus	student	1.95
Anderson, Richard C. & Biddle, W. Barry	1975	retention	elem-sec	adults	IL	rural	student	0.52
Fiel, R.L., & Okey, J.R.	1975	mastery testing	elem-sec	lower secondary	IN	city	student	0.66
Goldwater, B.C. & Acker, L.E.	1975	mastery testing	postsec	undergrad	Canada	campus	student	0.77
Jones, F.G.	1975	mastery testing	elem-sec	lower secondary	GA	metro area	student	0.57
Knight, J.M., Williams, J.D., & Jardon, M.L.	1975	mastery testing	postsec	undergrad	TX	campus	student	0.60
Modigliani, Vito	1975	retention	elem-sec	lower secondary	CT	city	student	1.80
Anderson, Lorin W.	1975	mastery testing	elem-sec	lower secondary	SC	metro area	student	2.06
Decker, D.F.	1976	mastery testing	postsec	undergrad	RI	campus	student	2.28
Fehlen, J.E.	1976	mastery testing	postsec	undergrad	MN	campus	student	0.39
Gaynor, Jessica & Millham, Jim	1976	testing frequency	postsec	undergrad	TX	campus	student	0.36
Gay, Lorraine R., & Gallagher, Paul D.	1976	retention	postsec	graduate	FL	campus	student	0.94
Hymel, G.M. & Gaines, W.G.	1977	mastery testing	elem-sec	upper secondary	LA	city	student	1.84
Kulik, J.A., Kulik, C. C., & Hertzler, E.C.	1977	mastery testing	postsec	undergrad	MI	campus	student	0.62
Nation, J.R., Massad, P., & Wilkerson, D.	1977	mastery testing	postsec	undergrad	TX	campus	student	0.86
Landauer, T.K. & Bjork, R.A.	1978	retention	postsec	undergrad	IL	campus	student	0.75

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Badia, Harsh, & Stutts	1978	testing frequency	postsec	undergrad	OH	campus	student	0.40
Caldwell, E.C., et al.	1978	mastery testing	postsec	undergrad	WV	campus	student	1.60
Strasler, G.M.	1978	mastery testing	elem-sec	lower secondary	SC	metro area	student	1.66
Wellisch, J., et al.	1978	accountability	elem-sec	intermediate	CA	city	school	1.17
Burrows, Charles K. & Okey, James R.	1979	mastery testing	elem-sec	intermediate	IN	city	student	2.24
Guskey, T.R. & Monsaas, J.A.	1979	mastery testing	postsec	community postsec	IL	campus	student	0.16
Down, A. Graham	1979	accountability	elem-sec	upper secondary	CO	city	student	1.45
Down, A. Graham	1979	accountability	elem-sec	upper secondary	NC	school district	student	1.22
Benson, J.S. & Yeany, R.H.	1980	mastery testing	postsec	undergrad	GA	campus	student	1.05
Chiappetta, E.L. & McBride, J.W.	1980	mastery testing	elem-sec	lower secondary	TX	n/a	student	0.61
Yeany, R.H., Dost, R.J., & Matthews, R.W.	1980	mastery testing	postsec	undergrad	GA	campus	student	0.76
Parramore, Barbara M., et al.	1980	accountability	elem-sec	upper secondary	NC	all	student	0.83
Duchastel, P.C.	1981	retention	elem-sec	lower secondary	UK	n/a	student	0.05

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Leppmann, P.K., & Herrmann, T.F.	1981	testing frequency	postsec	undergrad	Canada	campus	student	0.94
Lueckemeyer, C.L. & Chiappetta, E. L.	1981	mastery testing	elem-sec	upper secondary	TX	suburban	student	0.56
Saunders-Harris, R, & Yeany, R.H.	1981	mastery testing	elem-sec	lower secondary	GA	metro area	student	0.51
Nungester, Ronald J. & Duchastel, Philippe C.	1982	retention	elem-sec	upper secondary	PA	suburban	student	0.64
Bryant, N. Dale; Fayne, Harriet R.: & Gettinger, Maribeth	1982	mastery testing	elem-sec	intermediate	NY, IN	city	student	1.82
Mayer, V.J., & Rojas, C.A.	1982	testing frequency	elem-sec	lower secondary	OH	suburban	student	0.13
Brunton, Max L.	1982	accountability	elem-sec	upper secondary	OR	school district	student	0.81
Arlin, M. & Webster, J.	1983	mastery testing	elem-sec	lower secondary	Canada	city	student	0.82
Clark, C.R.; Guskey, T.R.; & Benninga, J.S.	1983	mastery testing	postsec	undergrad	KY	campus	student	0.89
Dillashaw, F.G. & Okey, J.R.	1983	mastery testing	elem-sec	secondary	SC	rural	student	0.88
Runquist, Willard N.	1983	retention	postsec	undergrad	Canada	campus	student	2.96
Fuchs, Lynn S.; Deno, Stanley L.; & Mirkin, Phyllis K.	1984	testing frequency	elem-sec	intermediate	NY	city	teacher	0.77
Dunkelberger, G.E., Henry Heikkinen	1984	mastery testing	elem-sec	lower secondary	DE	suburban	student	0.20

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Guskey, T.R., Benninga, J.S., & Clark, C.R.	1984	mastery testing	postsec	undergrad	n/a	campus	student	0.78
Slavin, R.E. & Karweit, N.L.	1984	mastery testing	elem-sec	lower secondary	PA	city	student	0.09
Ketchie, Gary Joseph	1984	accountability	elem-sec	upper secondary	LA, FL	all	school	3.71
Marsh, Robert	1984	retention	postsec	undergrad	NC	campus	student	0.60
Walstad, William B	1984	practice test	elem-sec	lower secondary	MO	all	district	0.27
LeMahieu, Paul G.	1984	mastery testing	elem-sec	primary	PA	city	student	0.19
Blackburn, K.T, & Nelson, D	1985	mastery testing	postsec	undergrad	GA	campus	student	1.69
McDaris, M. A.	1985	testing frequency & mastery testing	postsec	undergrad	OK	campus	student	5.77
Hyde, R. M., et al.	1985	accountability	postsec	graduate	OK	campus	student	1.32
Fuchs, Lynn S., & Fuchs, Douglas	1986	mastery testing	elem-sec	primary	MN	rural	student	0.32
Mangino, E.; Battaile, R.; Washington, W.; & Rumbaut, M.	1986	accountability	elem-sec	upper secondary	TX	metro area	student	0.44
Rohm, R.A.; Sparzo, F.J.; & Bennett, C.M.	1986	retention	postsec	undergrad	IN	campus	student	1.97
Koffler, Stephen L.	1987	accountability	elem-sec	lower secondary	NJ	all	student	0.47



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Winfield, Linda F.	1987	accountability	elem-sec	lower secondary	US	all	student	0.28
Beaulieu, R. P., & Frost, B. F.	1989	testing frequency	postsec	undergrad	MI	campus	student	0.60
Dineen, P, Taylor, J. & Stephens, Larry.	1989	testing frequency	elem-sec	upper secondary	NE	suburban	student	0.61
Glover, John A.	1989	retention	postsec	undergrad	IN	campus	student	1.94
Strawitz, Barbara M.	1989	testing frequency	postsec	undergrad	LA	campus	student	0.26
Haynie, W.J. III	1990	retention	elem-sec	lower secondary	NC	all	student	0.66
Cone, Al L.	1990	testing frequency & mastery testing	postsec	undergrad	ND	campus	student	0.56
Johnson, P.E.	1990	testing frequency & mastery testing	postsec	undergrad	NC	campus	student	0.99
Schloss, P. J., Smith, M. A., & Posluzny, M.	1990	mastery testing	postsec	graduate	NY	campus	student	1.06
McTarnaghan, Roy E.	1990	accountability	postsec	undergrad	FL	all	student	0.93
Clariana, R.B., Ross, S.M., & Morrison, G.R.	1991	mastery testing	elem-sec	upper secondary	TN	city	student	1.06
Haynie, W.J. III	1991	retention	postsec	undergrad	NC	campus	student	0.92
Rodgers, Natalie; and Others	1991	accountability	elem-sec	upper secondary	TX	metro area	student	0.11
Morris, Don R.	1991	accountability	elem-sec	all	FL	city	student	1.60

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Kika, Frank M.; McLaughlin, T.F.; and Dixon, J.	1992	testing frequency	elem-sec	upper secondary	British Columbia	rural	student	0.40
Carrier, Mark, & Pashler, Harold	1992	retention	postsec	undergrad	CA	campus	student	0.72
Jacobson, J.E.	1992	accountability	elem-sec	upper secondary	US	all	student	0.65
Potter, David C., & Wall, Mary Ellen	1992	accountability	elem-sec	primary	SC	all	student	0.25
Wheeler, Mark A., & Roediger, Henry L., III	1992	testing frequency	postsec	undergrad	TX	campus	student	1.45
Brown, Steven M. & Walberg, Herbert J.	1993	accountability	elem-sec	primary	IL	city	student	0.38
Chao-Qun, Wei & Hui, Zhang	1993	accountability	elem-sec	all	China	city	student	1.07
Haynie, W.J. III	1994	retention	postsec	undergrad	NC	campus	student	0.64
Ritchie, Donn & Thorkildsen, Ron	1994	accountability	elem-sec	intermediate	n/a	city	student	1.35
Fredericksen, N.	1994	accountability	elem-sec	primary	US	all	student	0.11
Haynie, W.J. III	1995	retention	postsec	undergrad	NC	campus	student	1.10
Haynie, W.J. III	1997	retention	postsec	undergrad	NC	campus	student	1.17
Strauss, R.P., Bowes, L.L., Marks, M.S., & Plesko, M.R.	1998	accountability	elem-sec	lower secondary	PA	all	district	0.17

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Grissmer, David & Flanagan, Ann	1998	accountability	elem-sec	lower secondary	US	all	student	0.20
Deck, D. W. Jr.	1998	testing frequency	postsec	undergrad	WV	campus	student	0.34
Bishop, John H.	1999	accountability	elem-sec	upper secondary	Canada	all	school	0.66
DeMars, C.E.	2000	accountability	elem-sec	upper secondary	MI	all	student	0.74
Klass, G., & Crothers, L.	2000	mastery testing	postsec	undergrad	IL	campus	student	1.07
Bishop, John H.	2000	accountability	elem-sec	upper secondary	US	all	state	1.76
Massachusetts Finance Office	2000	accountability	elem-sec	primary	MA	all	student	0.24
Toenjes, L.A., Dworkin, A.G., Lorence, J., & Hill, A.N.	2000	accountability	elem-sec	upper secondary	TX	all	student	0.38
Wenglinsky, Harold	2000	testing frequency	elem-sec	lower secondary	US	all	student	3.19
Woessmann, Ludger	2000	accountability	elem-sec	secondary	international	all	student	0.15
Guza, D. S., & McLaughlin, T. F.	2001	testing frequency	elem-sec	intermediate	British Columbia	n/a	student	0.65
Phelps, Richard	2001	accountability	elem-sec	lower secondary	international	all	nation	3.19
Rosenblatt, Zehava, & Offer, Shimoni	2001	accountability	elem-sec	lower secondary	Israel	n/a	student	0.34
Jacob, Brian A	2001	accountability	elem-sec	secondary	US	all	student	0.02

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Bishop, J.H., Mane, F., Bishop, M., & Moriatry, J.	2001	accountability	elem-sec	intermediate, secondary	US	all	student	0.50
Haynie, W.J. III	2002	retention	postsec	undergrad	NC	campus	student	1.15
Haynie, W.J. III	2002	retention	postsec	undergrad	NC	campus	student	0.29
Tighe, Erin, Wang, Aubrey, & Foley, Ellen	2002	accountability	elem-sec	all	PA	city	school	1.47
Carnoy, Martin; Loeb, Susanna	2002	accountability	elem-sec	intermediate	US	all	student	0.78
Amrein & Berliner	2002	accountability	elem-sec	intermediate, lower secondary	US	all	student	0.09
Haynie, W.J. III	2003	retention	postsec	undergrad	NC	campus	student	0.86
McDonald, Betty & Boud, David	2003	mastery testing	elem-sec	upper secondary	Barbados	all	student	0.50
Standards Work, Inc.	2003	accountability	elem-sec	all	VA	all	student	0.19
Baek, Sun-Geun, & Kim, Kyoung Jin	2003	mastery testing	early childhood	early childhood	Korea	n/a	student	1.27
Meisels, et al.	2003	accountability	elem-sec	primary	PA	city	student	0.74
Noble, Julie	2003	practice test	elem-sec	secondary	US	all	student	0.10
Braun, Henry	2003	accountability	elem-sec	intermediate	US	all	student	0.22
Amrein-Beardsley & Berliner	2003	accountability	elem-sec	intermediate	US	all	student	0.61

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Raymond, M.E., & Hanushek, E.A.	2003	accountability	elem-sec	intermediate	US	all	student	0.95
Rosenshine	2003	accountability	elem-sec	intermediate, lower secondary	US	all	student	0.66
Bishop, John H.	2004	accountability	elem-sec	secondary	international	all	nation	0.24
Hanushek, E.A. & Raymond, M.E.	2004	accountability	elem-sec	intermediate, lower secondary	US	all	student	0.31
Audette, Bernard P.	2005	accountability	elem-sec	upper secondary	MA	school district	student	1.42
Baek, Sun-Geun, & Hwang, Eun-Hui	2005	testing frequency	elem-sec	lower secondary	Korea	n/a	student	1.13
Roediger, Henry L., III, & Marsh, Elizabeth J.	2005	retention	postsec	undergrad	MO	campus	student	2.73
Williams, Natasha J., & Noble, Julie P.	2005	practice test	elem-sec	upper secondary	US	all	school	1.83
Chan, J.C.K., McDermott, K.B., & Roediger, H.L. III	2006	retention	postsec	undergrad	MO	campus	student	1.66
Grodsky, Warren, & Kalogrides	2006	accountability	elem-sec	lower secondary	US	all	student	0.06
Roediger, H.L., III, & Karpicke, J.D.	2006	retention	postsec	undergrad	MO	campus	student	0.92
Struyven, K., Dochy, F., Janssens, S., Schelfhout, W., & Gielen, S.	2006	testing frequency	postsec	undergrad	Belgium	campus	student	1.27
Nichols, S.L., Glass, G.V., & Berliner, D.C.	2006	accountability	elem-sec	intermediate	US	all	student	0.21
Alvarez, J.; Moreno, V.G.; & Patrinos, H.A.	2007	accountability	elem-sec	upper secondary	Mexico	all	student	0.33

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Karpicke, Jeffrey D., & Roediger, Henry L. III	2007	retention	postsec	undergrad	MO	campus	student	0.80
ACT	2008	practice test	elem-sec	upper secondary	AR, OK, WV	all	student	0.09
Marsh, E.J., Agarwal, R.K., & Roediger, H.L. III	2009	retention	postsec	undergrad	NC	all	student	2.13
Marsh, E.J., Agarwal, R.K., & Roediger, H.L. III	2009	retention	elem-sec	upper secondary	IL	all	student	3.87

\* These are unweighted effect sizes adjusted for measurement imprecision in the dependent variable and, where appropriate, small study sample size.

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