

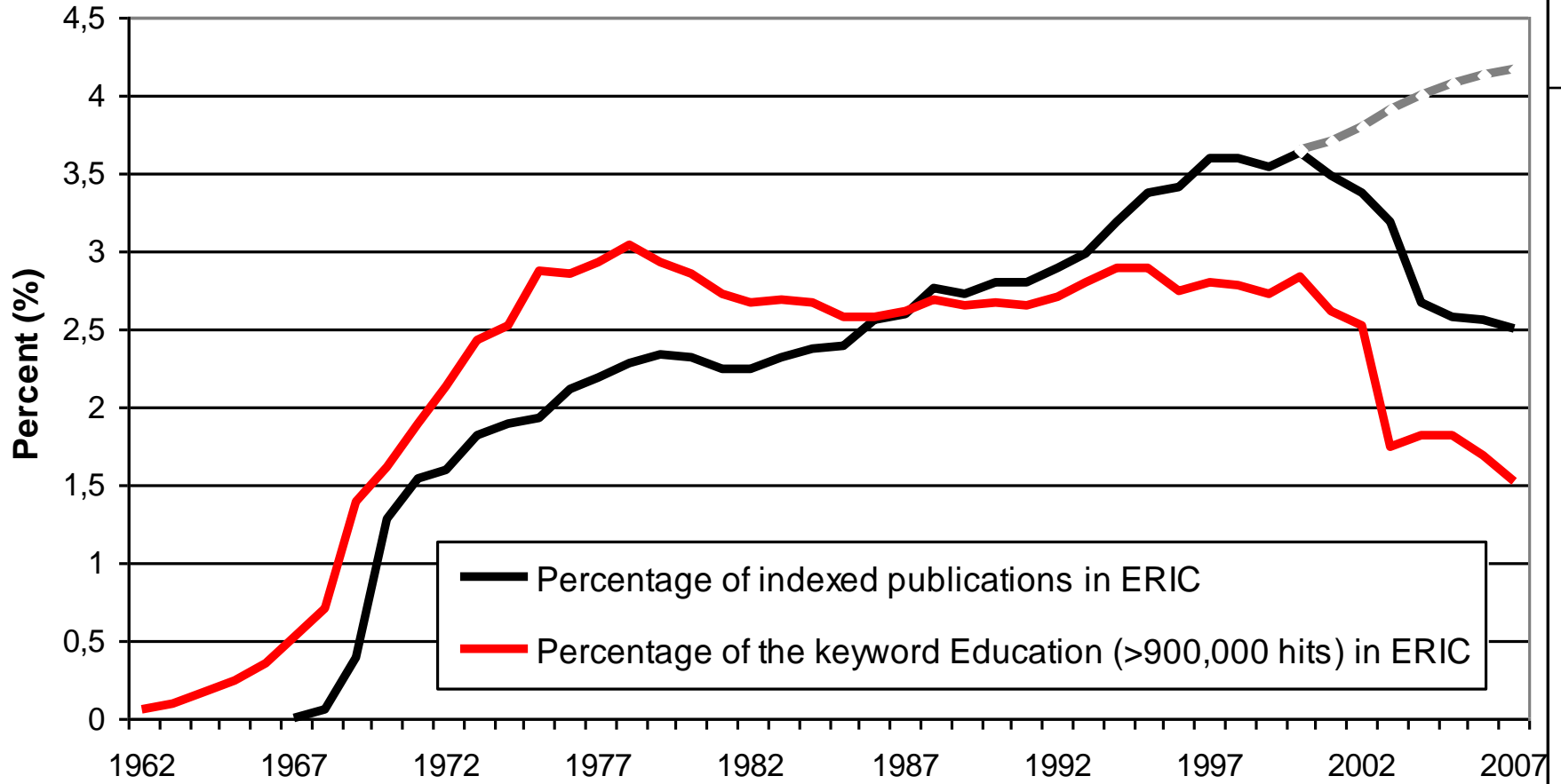
Jari Metsämuuronen, PhD, Dos
2.10.2008 Helsinki

The Next Wave in Educational Research?
**Comparative analysis of declining and rising
trends in educational research themes**

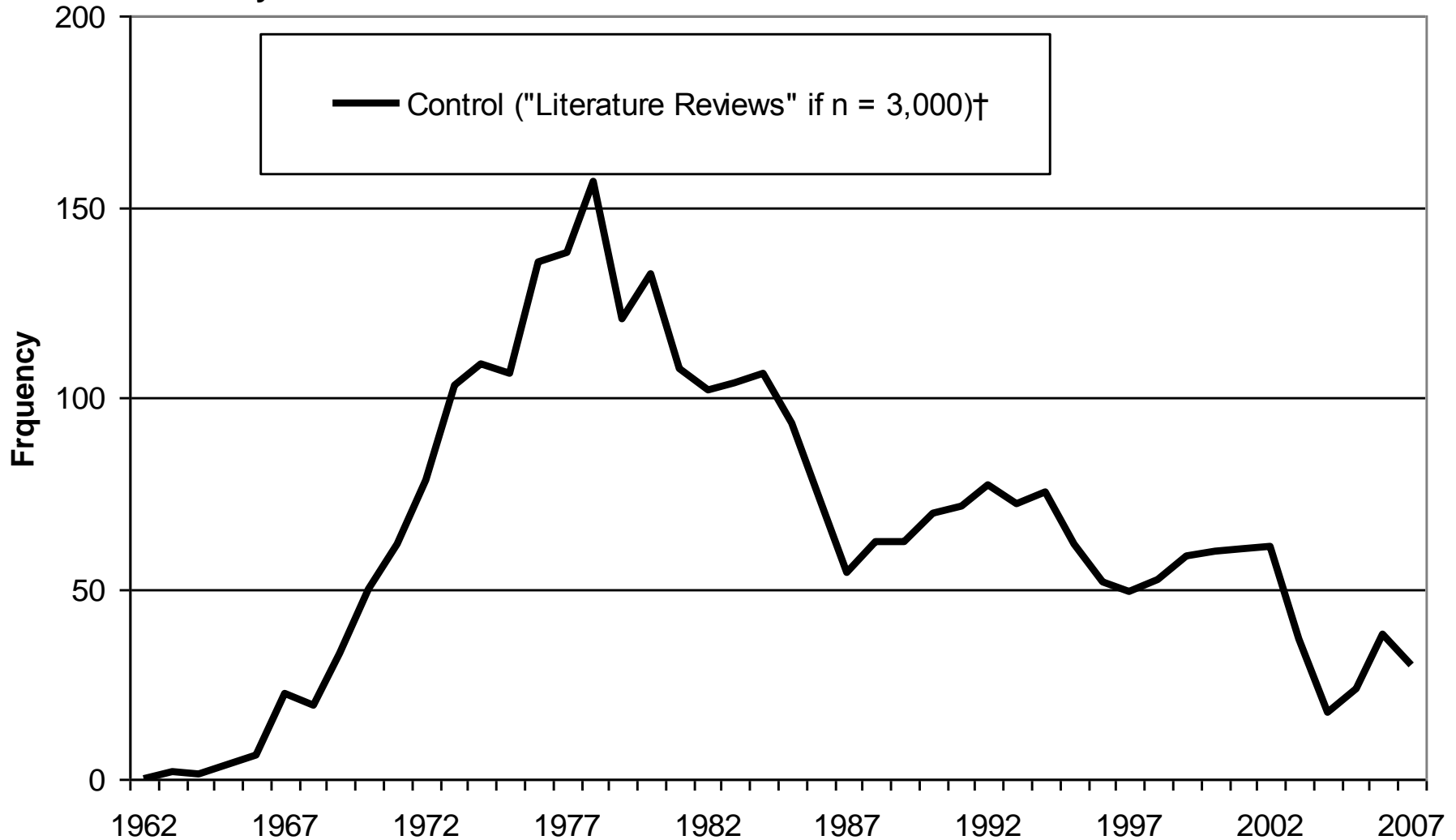
Some Obvious Trends in Educational Research

1. Increasing volumes of publications

Proportional distribution of the number of indexed publications per year and a common key word (Education, > 900,000 hits)

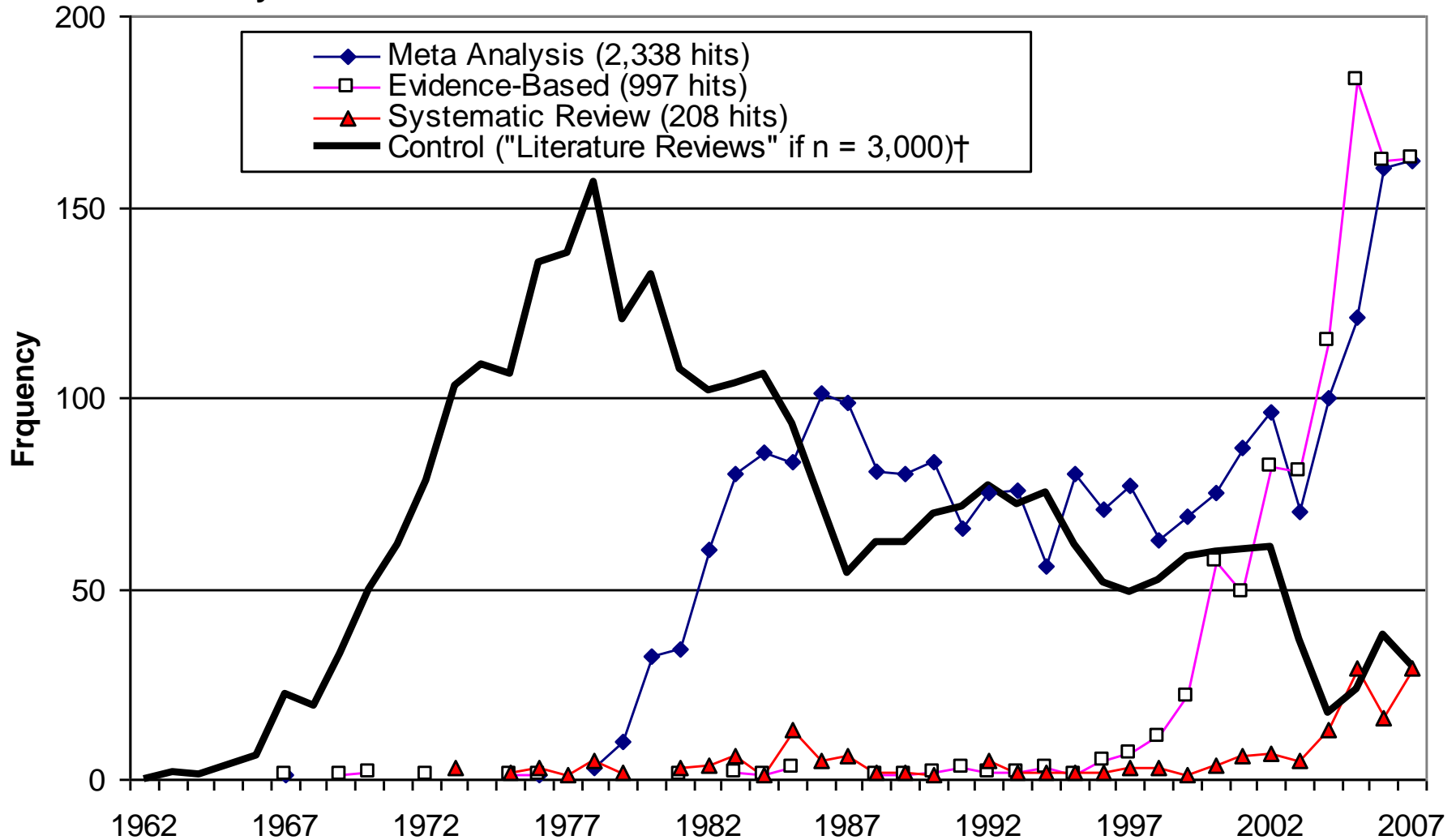


Long-term trends of themes "Meta Analysis", "Evidence-Based" and "Systematic Review" on the basis of free search in ERiC database



† There were total of 17,265 hits for the keyword "Literature Reviews". Here the proportions of the hits are used to point the trend. Actually there were 101 hits in year 2007.

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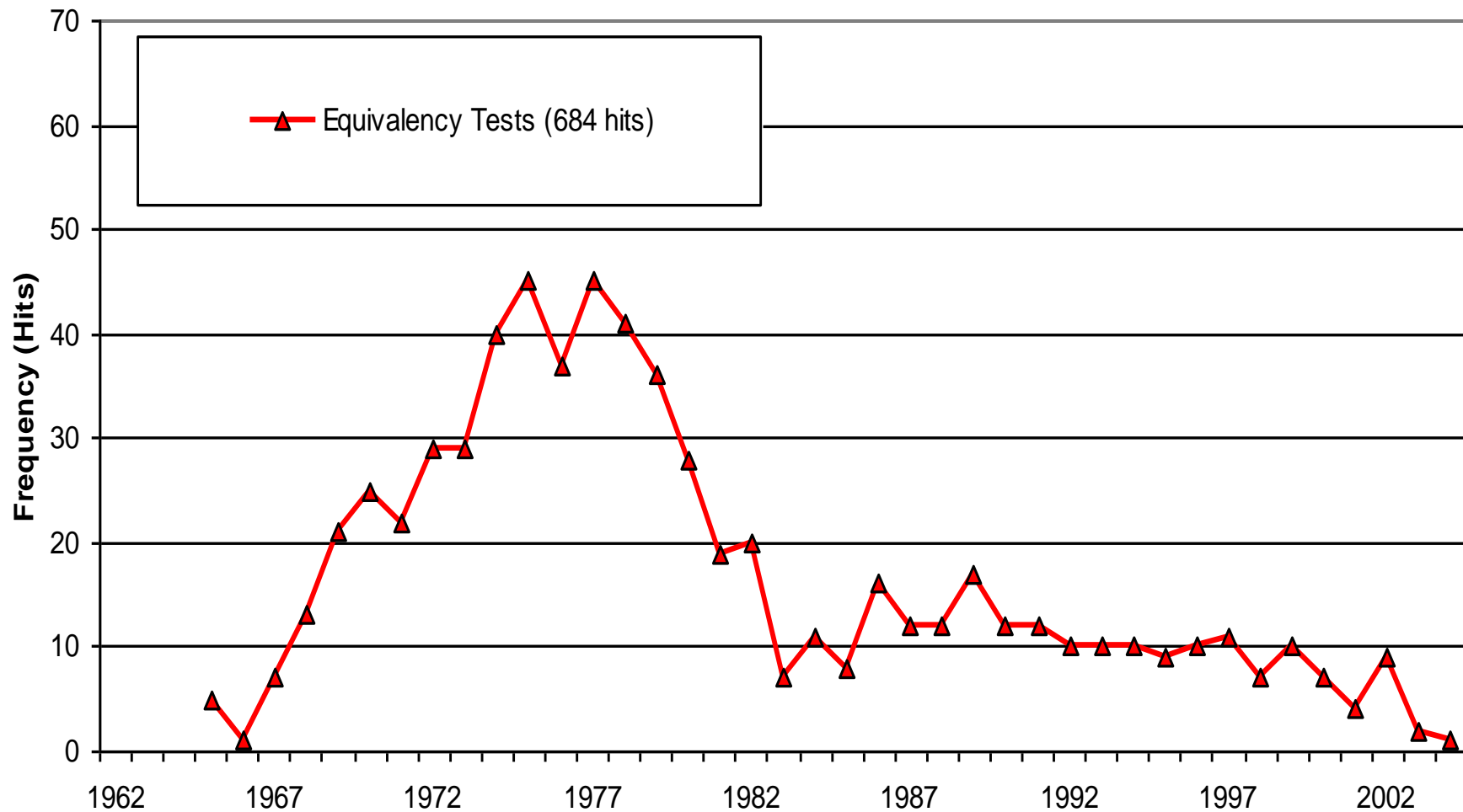


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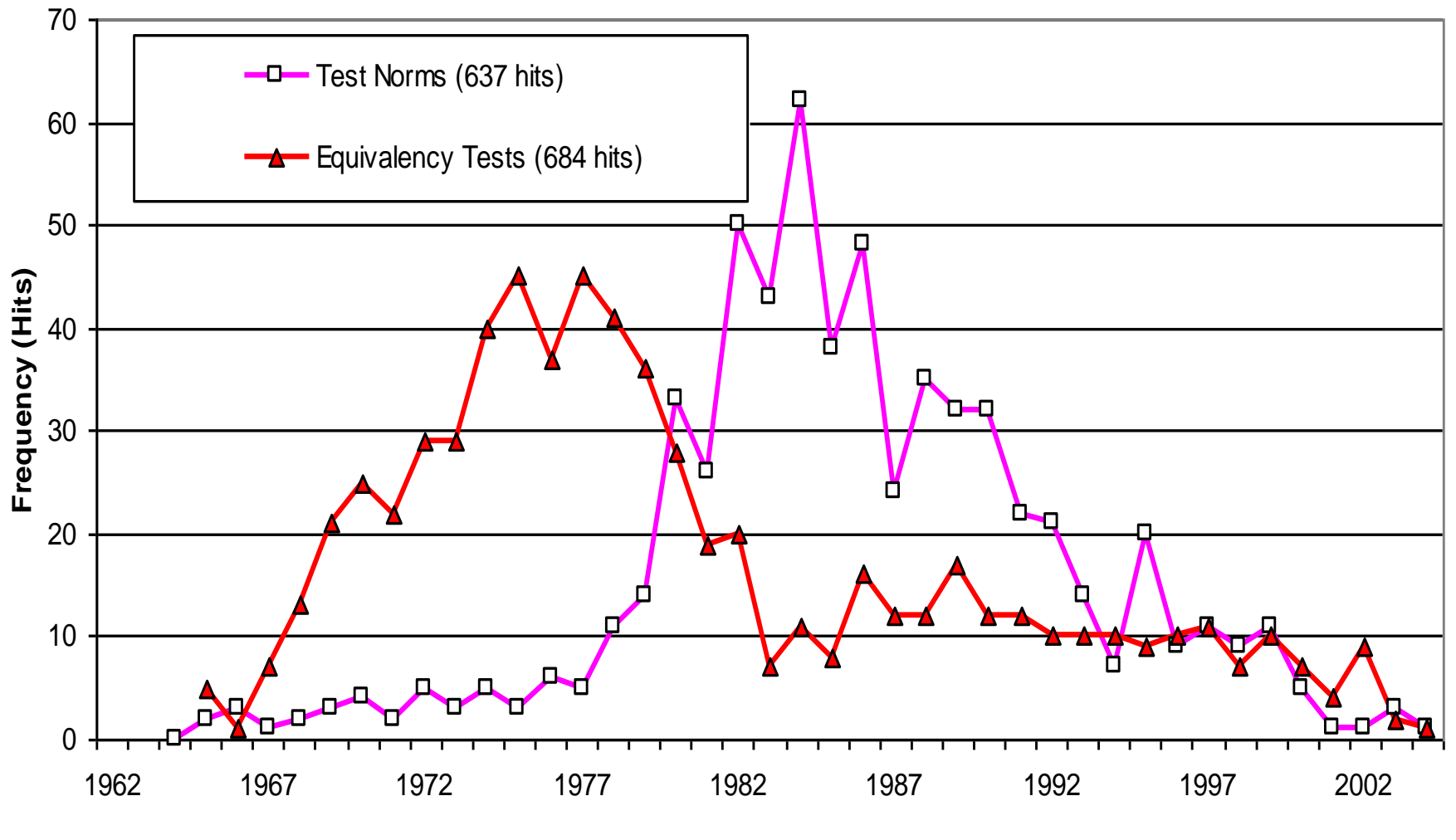
Some Obvious Trends in Educational Research

1. Increasing volumes of publications
2. Some themes are rising and fading

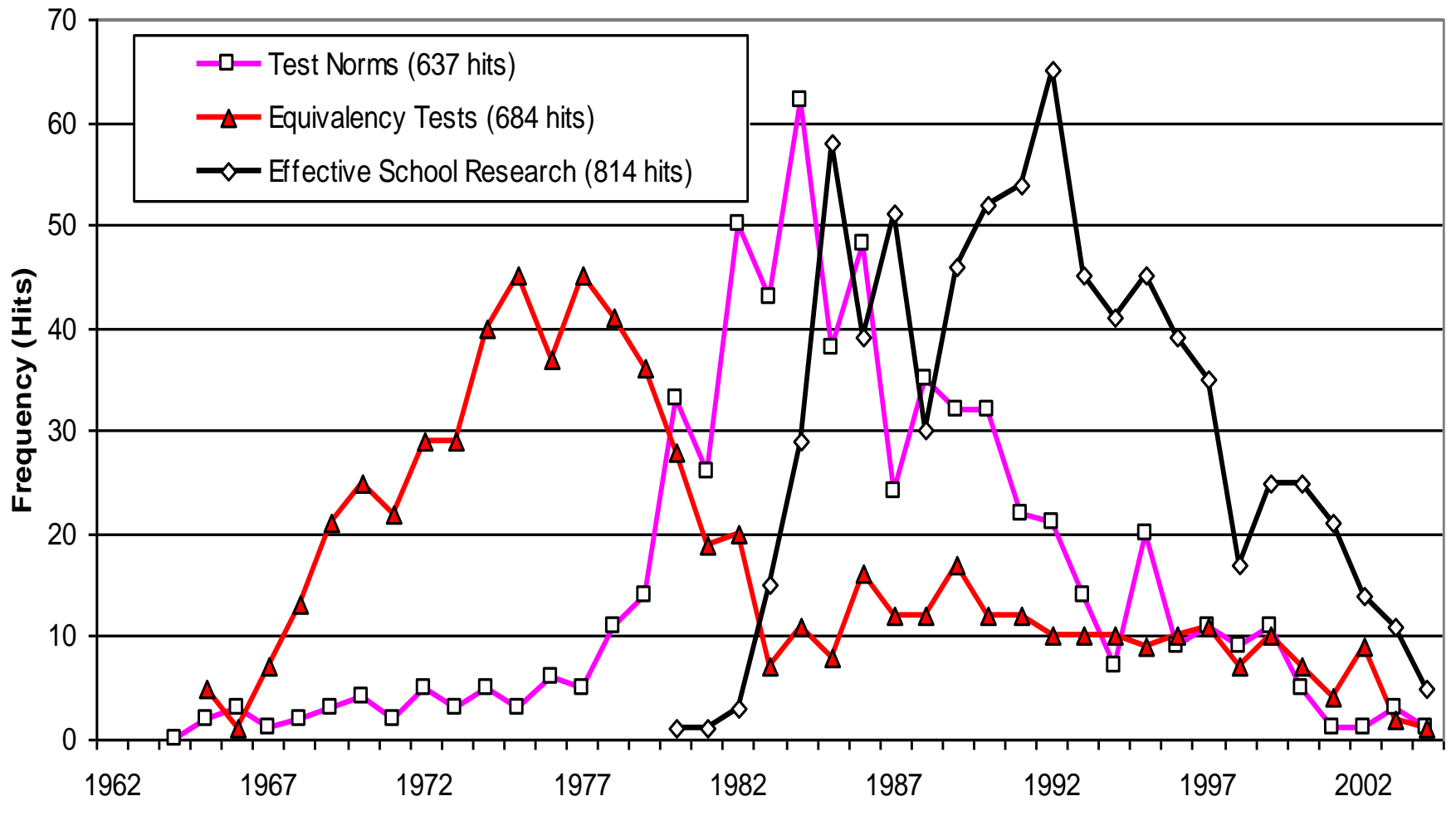
Research themes of selected fading themes in the ERIC database



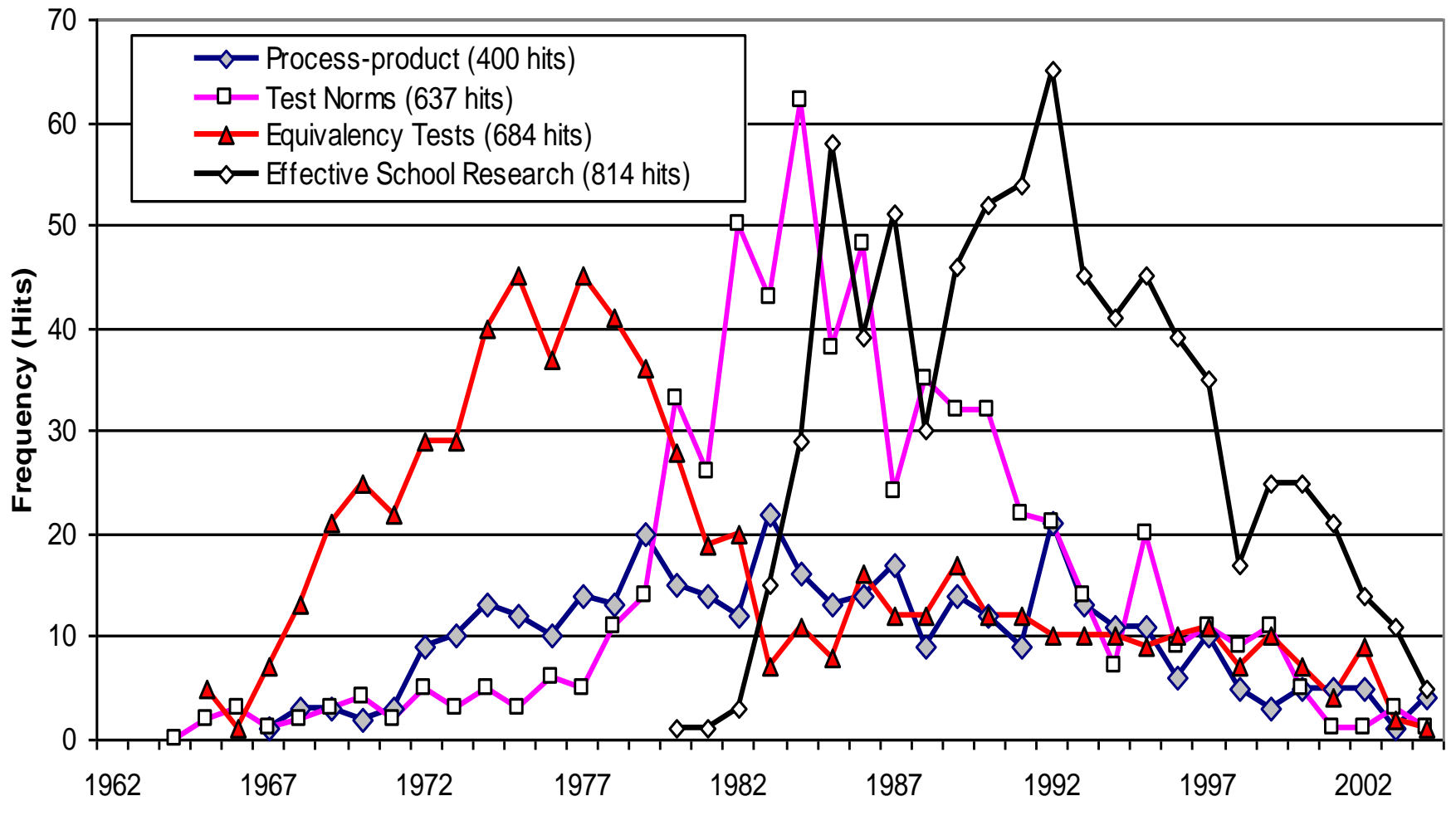
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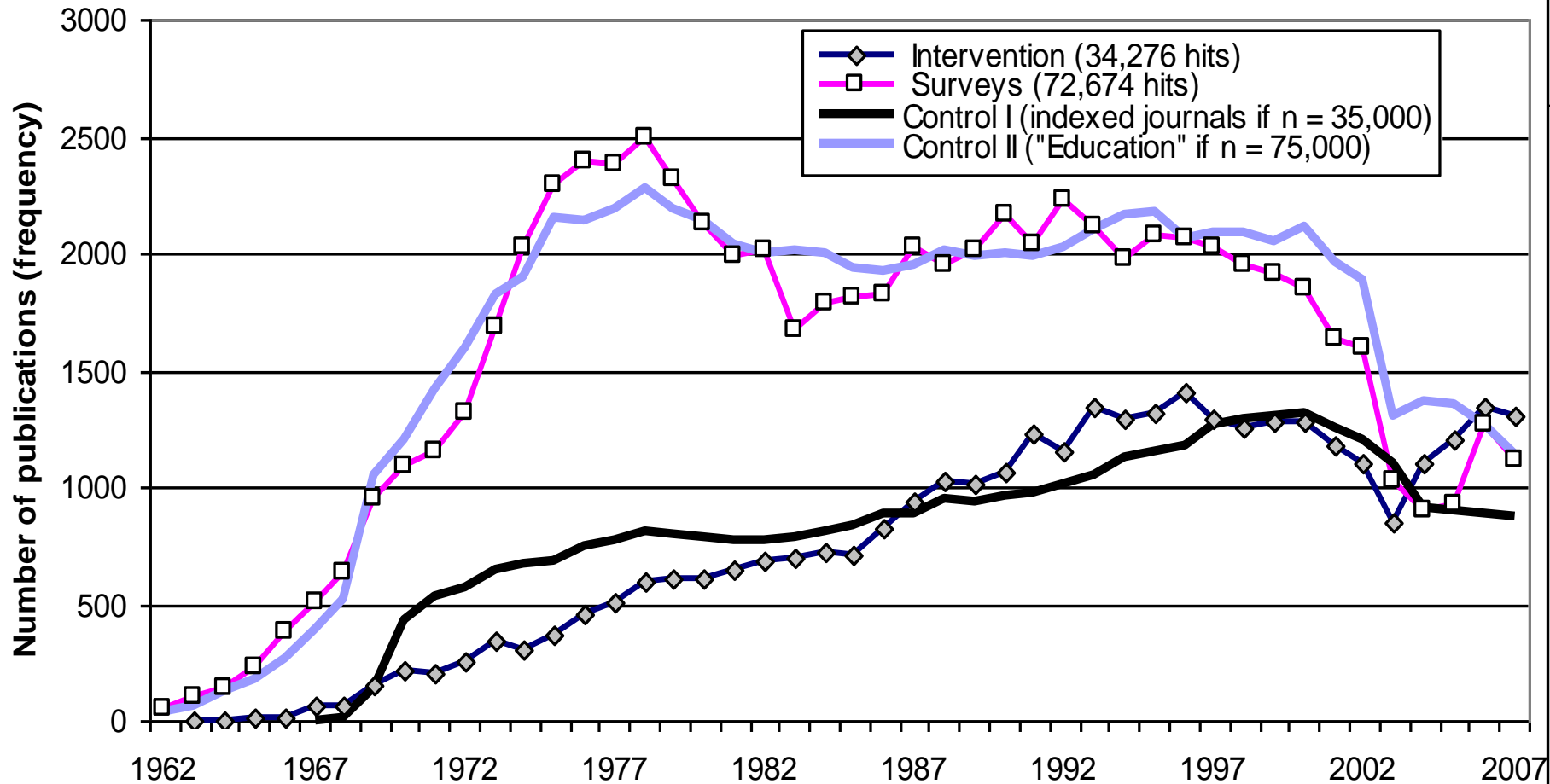
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Some Obvious Trends in Educational Research

1. Increasing volumes of publications
2. Some themes are rising and fading
3. Some themes are steadily productive

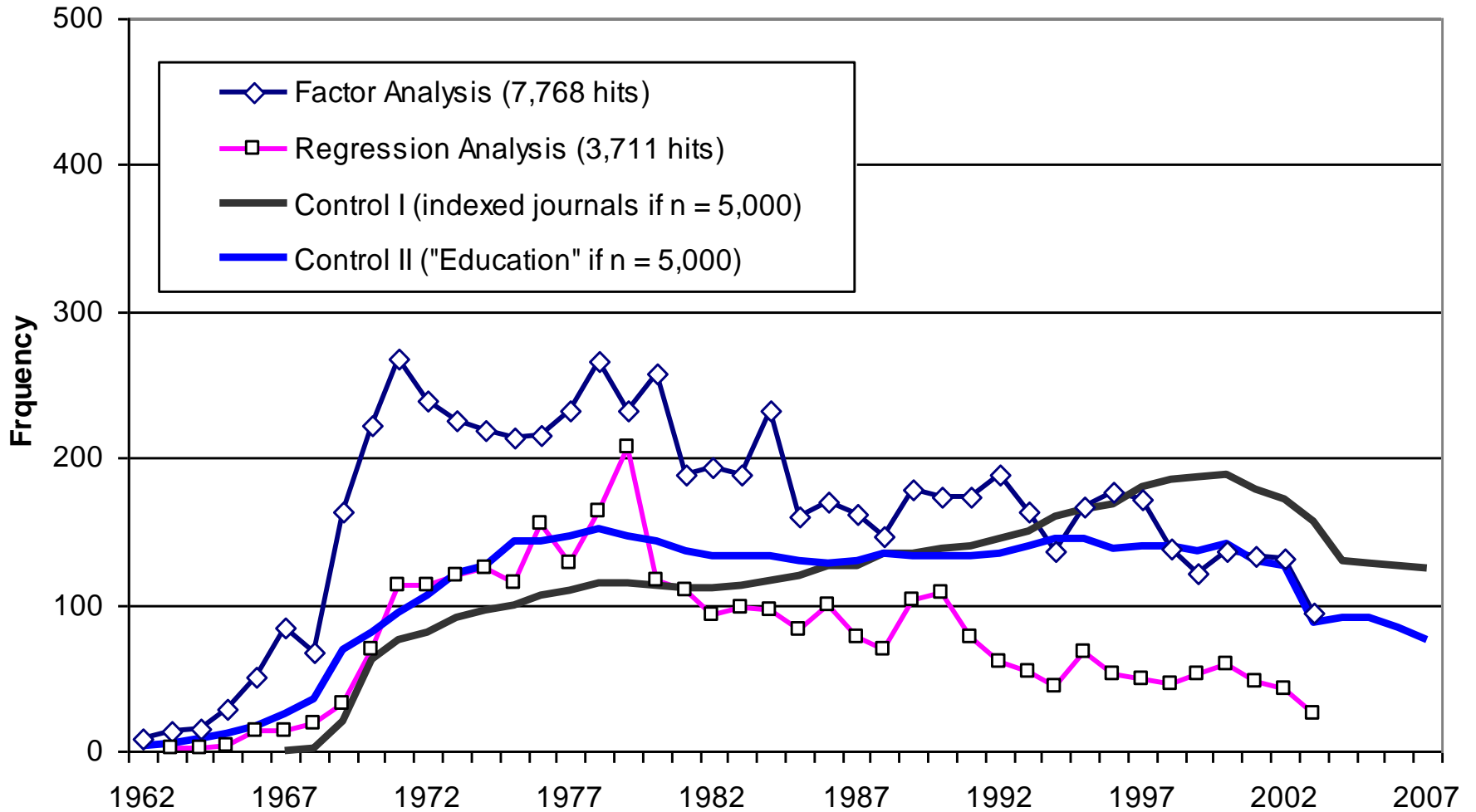
Long-term trends of keywords "Intervention" and "Surveys" in the ERIC database



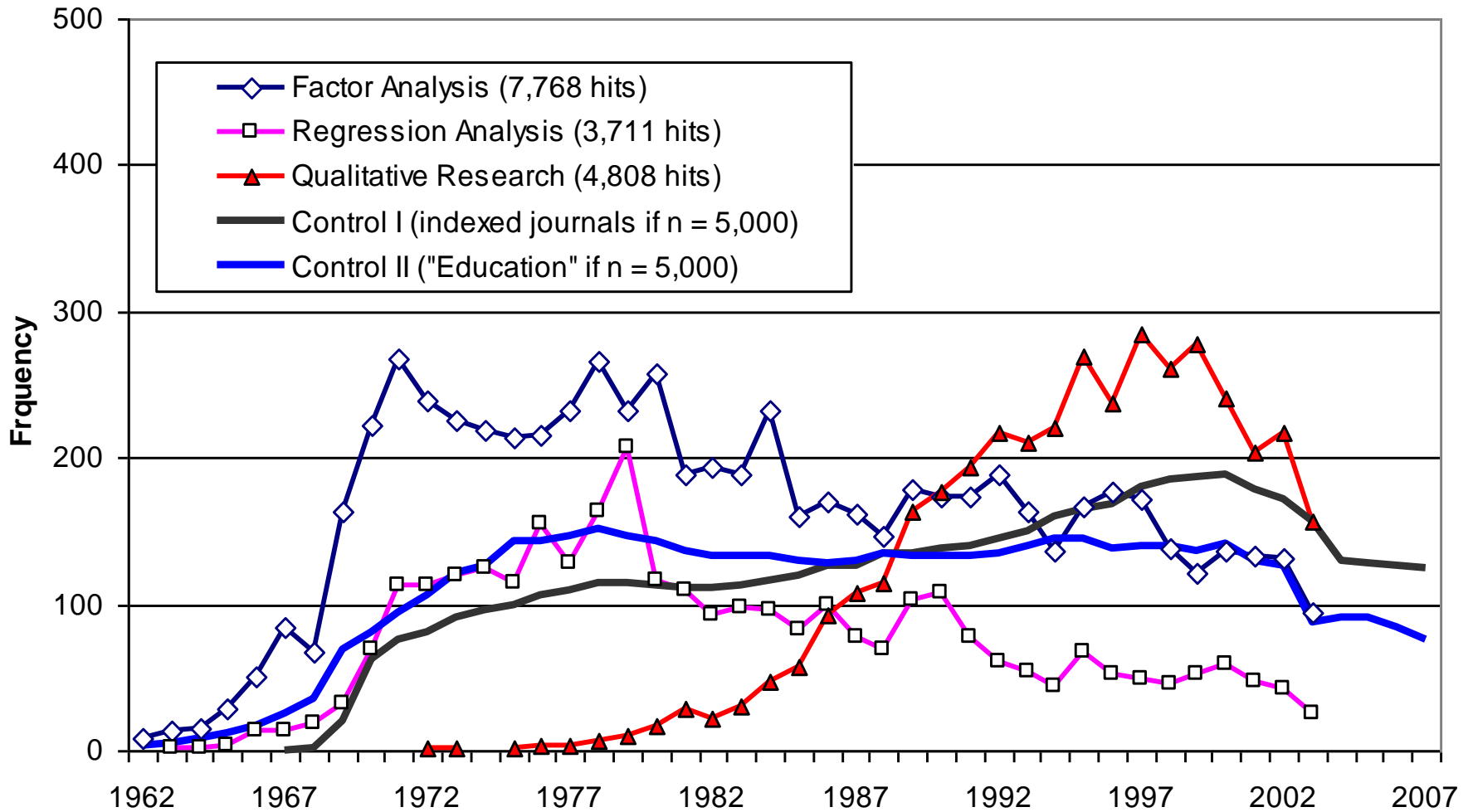
Some Obvious Trends in Educational Research

1. Increasing volumes of publications
2. Some themes are rising and fading
3. Some themes are steadily productive
4. Rising of qualitative research methodology

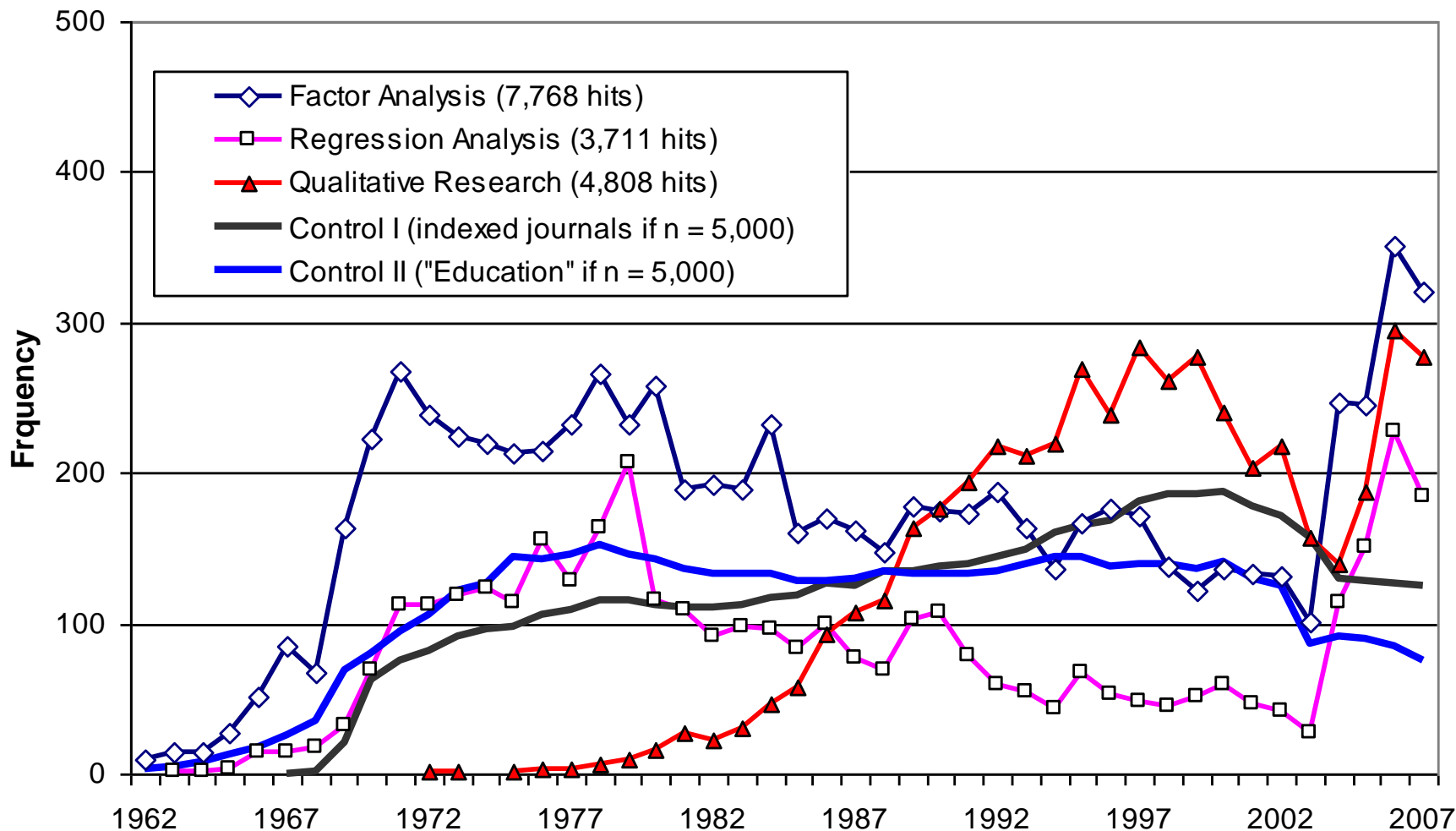
Long-term trends of themes "Factor analysis", Regression analysis", and "Quantitative Research" on the basis of free search in ERiC database



Long-term trends of themes "Factor analysis", Regression analysis", and "Quantitative Research" on the basis of free search in ERiC database



Long-term trends of themes "Factor analysis", "Regression analysis", and "Quantitative Research" on the basis of free search in ERiC database



Purpose of the study

To seek in a systematic manner

- ◆ most voluminous themes
- ◆ the most plausible rising themes, and
- ◆ the most plausible declining themes in the field of educational research on the basis of publications in ERIC database.

Methods

Prosedure:

1. Seek the Descriptors from the publications of years 2004 – 2007 (every 20th) in ERIC database.
 2. Seek the actual volumes of the hits with free search.
 3. Calculate statistical indicators for 1) short-term trend (STT) and 2) long-term trend (LTT) on the basis of free search hits.
- ✓ STT is estimated by Consistency of Trend (CT) and Magnitude of Change (MC) added with the information of the sign of the trend for four last years (negative or positive).

$$\text{STT} = \text{Sign}(\text{CT}+2\text{MC})$$

Examples of statistical indicators for short term trend

	Number of hits in four last years					Statistical indicators for short term trend					
	y2004	y2005	y2006	y2007	Total	B	Sign(B)	p-value	CT	BIN04-07	MC
Administrators	1011	1049	883	737	64888	-98,8	-1	0,096	1	2,81E-11	6
Higher Education	4642	4419	4569	4140	276 274	-135,6	-1	0,211	0	4,23E-08	6
Antisocial Behavior	143	163	198	264	3503	39,8	1	0,032	2	1E-09	6
Technology Uses in Education	46	85	136	145	1273	34,8	1	0,029	2	3,94E-13	6

CT= Consistency of Trend
MC = Magnitude of Change

p-value	weight
≤ 0.00001	6
≤ 0.0001	5
≤ 0.001	4
≤ 0.01	3
≤ 0.05	2
≤ 0.10	1
> 0.10	0

$$STT = \text{Sign}(CT+2MC)$$

$$STT_{\text{Administrators}} = -1(1+2*6) = -13$$

$$STT_{\text{Antisocial Behavior}} = +1(2+2*6) = +14$$

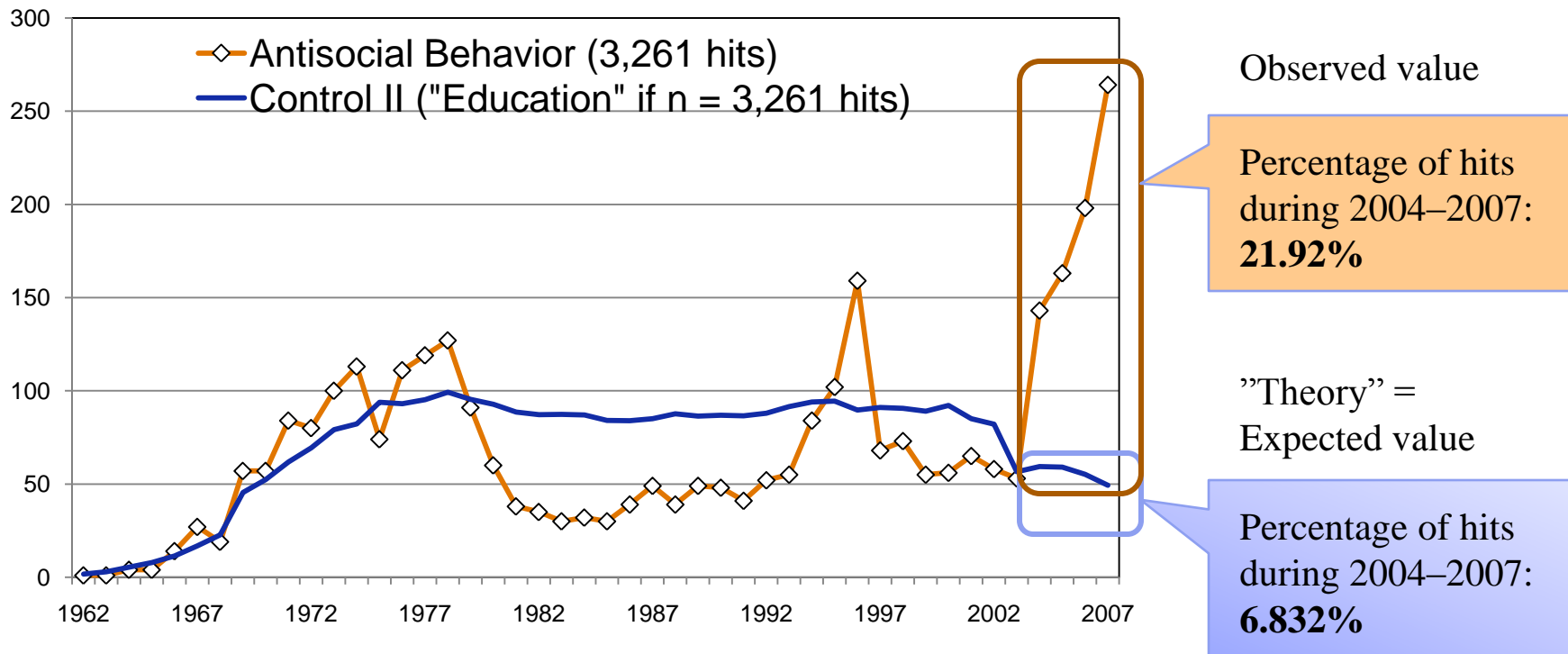


Methods

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$$\text{STT} = \text{Sign}(\text{SC} + 2\text{MC})$$
 - ✓ LTT is estimated with the shape of the distribution: location of the distribution (LD) compared to expected value and effect size (ES) of the difference between the proportions on the last four years mass in the distribution
$$\text{LTT} = \text{Sign}(\text{LD} + 2\text{ES})$$

Location of the distribution (LD)



Examples of statistical indicators for long term trend

	hits 04-07	Total	% of hits	Expected number of hits 04-07 when 6,832%	Location of the Distribution (LD) = BIN	weight for BIN = LD	Effect size (ES) of difference between proportions	weight for ES = ES	Sign(B)
Administrators	3680	64888	5,67	4433,4	3,02E-17	6	0,047994	0	-1
Higher Education	17770	276 274	6,43	18876,3	3,76E-09	6	0,016075	0	-1
Antisocial Behavior	768	3503	21,92	239,3	0	6	0,445671	3	1
Technology Uses in Education	412	1273	32,36	87,0	0	6	0,681425	4	1

p-value	weight
≤ 0.00001	6
≤ 0.0001	5
≤ 0.001	4
≤ 0.01	3
≤ 0.05	2
≤ 0.10	1
> 0.10	0

ES-value	weight
≥ 1.00	6
≥ 0.80	5
≥ 0.60	4
≥ 0.40	3
≥ 0.20	2
≥ 0.10	1
> 0.00	0

$$LTT = \text{Sign}(LD+2ES)$$

$$LTT_{\text{Administrators}} = -1(6+2*0) = -6$$

$$LTT_{\text{Antisocial Behavior}} = +1(6+2*3) = +12$$



Methods

Prosedure:

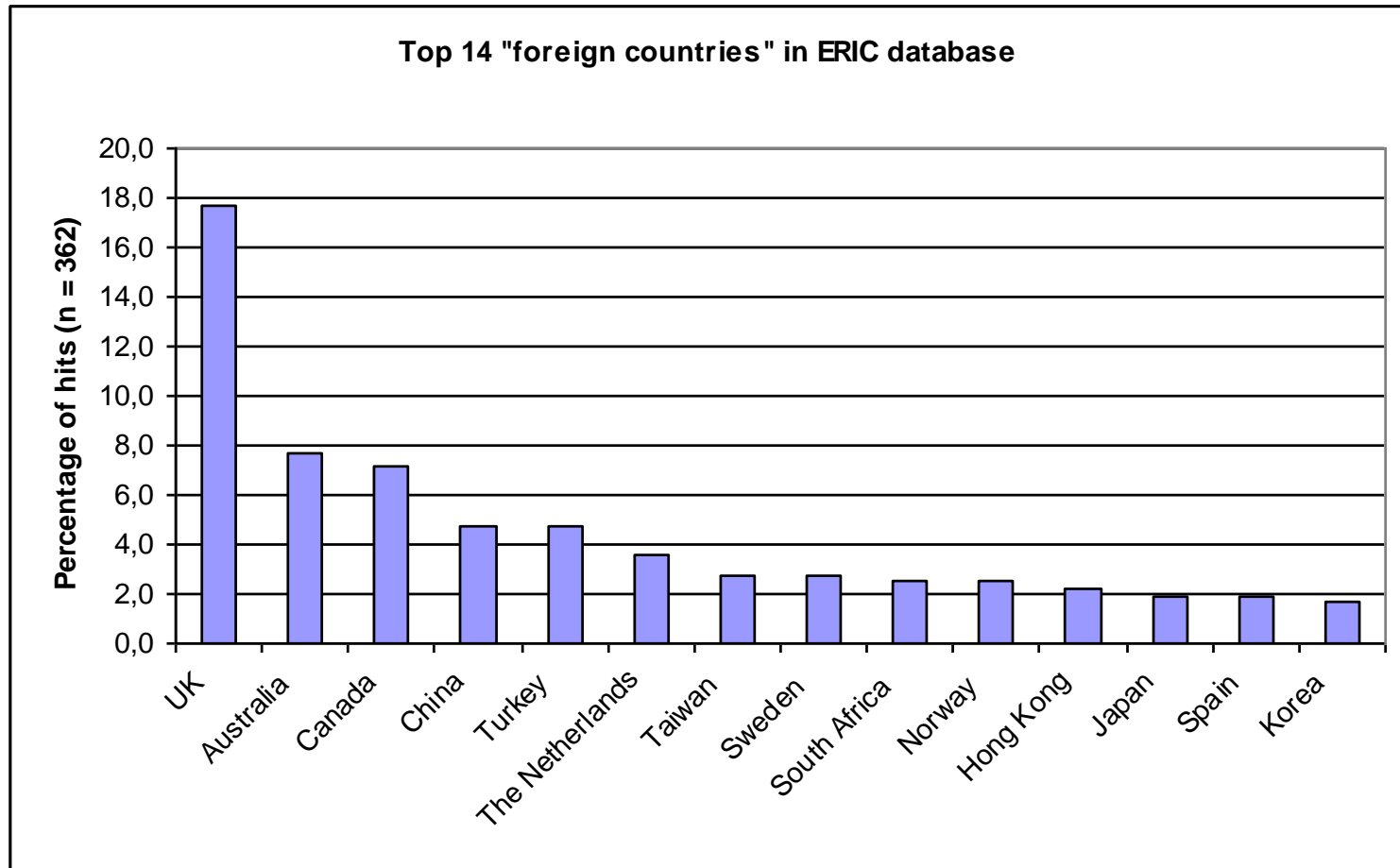
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$$\text{LTT} = \text{Sign}(\text{LD} + 2\text{ES})$$
4. Calculate Signed Rank (SR); $\text{SR} = \text{LTT} + \text{STT}$

Results IA: Top5 voluminous themes in the sample

Top5:

- 1. Foreign Countries (632 hits in the sample)**
- 2. Teaching Methods (419)**
- 3. Academic Achievement (250)**
- 4. Higher Education (239)**
- 5. Comparative Analysis (145)**

Results IA: Top5 voluminous themes in the sample



Results IB: Top15 voluminous themes with free search

Descriptor	hits 04-07	Total
Students	34852	417,480
Teachers	21010	253,150
Sciences	18038	55,783
Higher Education	17770	276, 274
Children	16732	195, 451
Social Sciences	16377	30,721
Social Studies	16375	52,604
Foreign Countries	15390	119, 426
Elementary Education	11398	87,000
Role	10777	180,671
Teaching Methods	10379	104 ,004
Psychology	10123	77,370
Early Childhood Education	9306	34,996
Secondary Education	9033	279,711
Communication Skills	8430	26,040

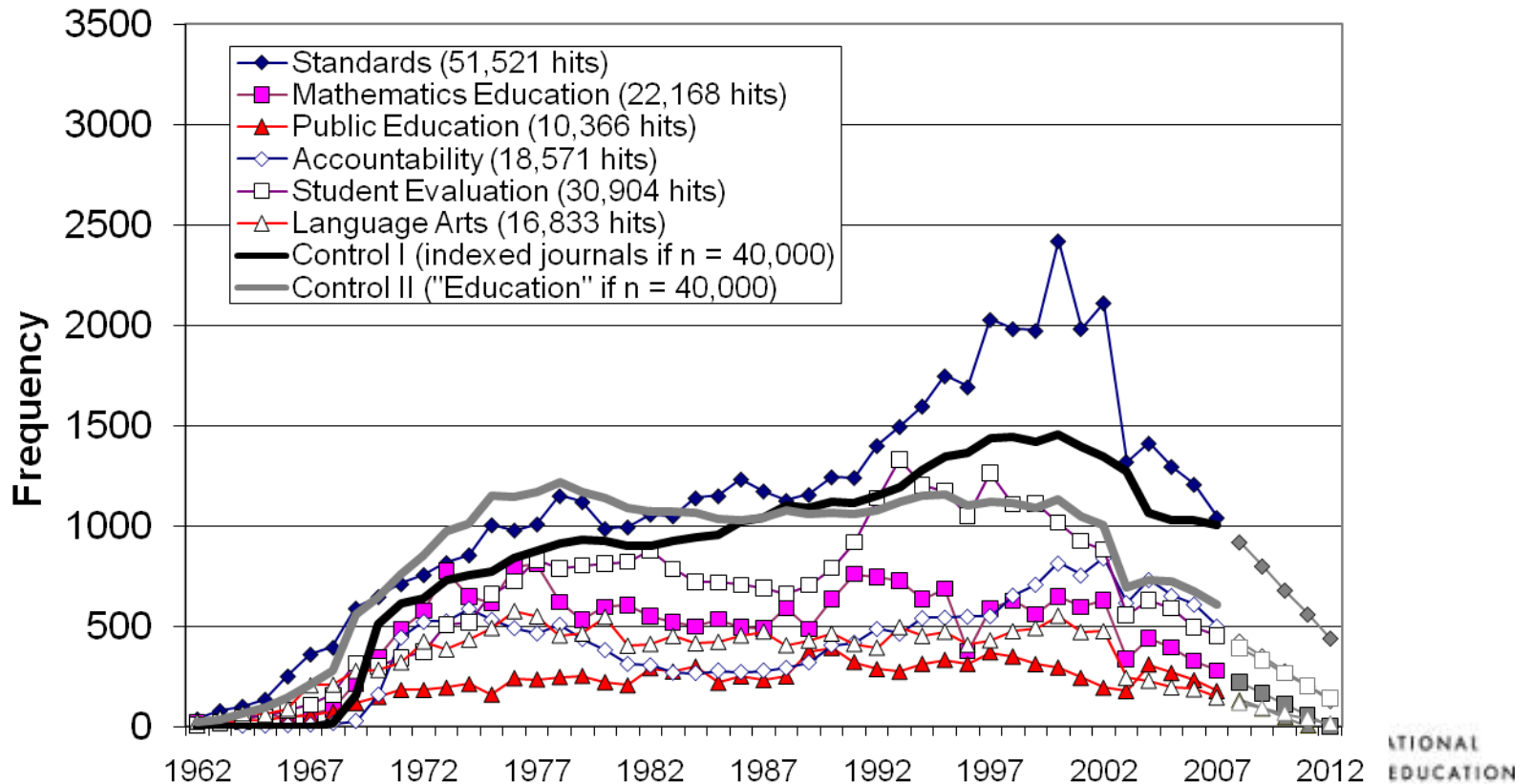
- Highly general themes
- Whether rising or declining – these themes will be seen in the near future

Results II: Top13 declining themes

Descriptor	hits 04-07	Total	SR
Administrators	3680	64888	-19
Higher Education	17770	276 274	-18
Curriculum	7819	165602	-18
Language Arts	750	16887	-18
Planning	4214	103397	-16
Mathematics Education	1438	22005	-15
History	4923	78237	-14
Student Evaluation	2166	30950	-14
Test Validity	709	12749	-13
Role	10777	180671	-12
Achievement Tests	551	8678	-12
Rating Scales	576	7645	-11
Counties	333	4125	-11

Selection of potentially declining themes

Long-term trends and linear extrapolation of selected themes based on free search in ERIC database



Results III: Top15 rising themes

Descriptor	hits 04-07	Total	SR
Gender Differences	3627	7526	32
Technology Uses in Education	412	1273	28
Antisocial Behavior	768	3503	26
Autism	1260	5038	26
At Risk Persons	1003	4801	25
Context Effect	1011	3887	25
Grades (Scholastic)	379	2866	24
Meta Analysis	543	2382	24
Behavior Problems	1534	10757	24
Qualitative Research	900	4866	23
Correlation	2923	15 101	23
Pretests Posttests	517	3528	22
Racial Differences	930	7981	22
Predictor Variables	1723	11876	22
Social Sciences	16377	30721	22



FINNISH NATIONAL
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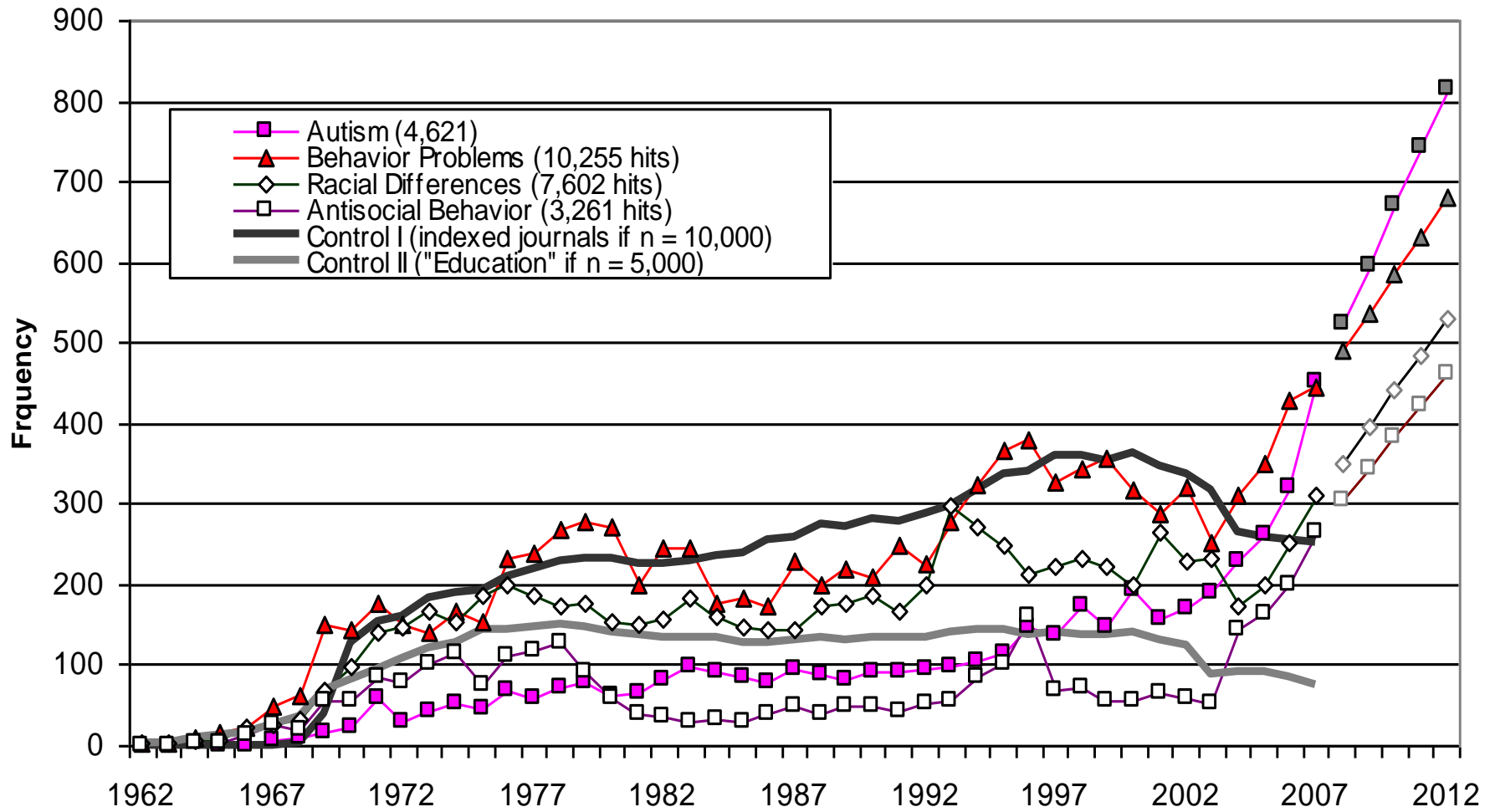
Results III: Top15 rising themes

Quite interestingly and sadly, the most potentially rising trends include:

- ✓ Antisocial Behavior
- ✓ Autism
- ✓ At Risk Persons
- ✓ Behavior Problems

These indicate concern on modern problems in our schools. They may indicate uncertainty and complexity in our world as well as the threats of tragedies – such as school massacres – in variety of societies, or at least a need to try to explain them. In any case, they reflect the highly weighted individual values in western world.

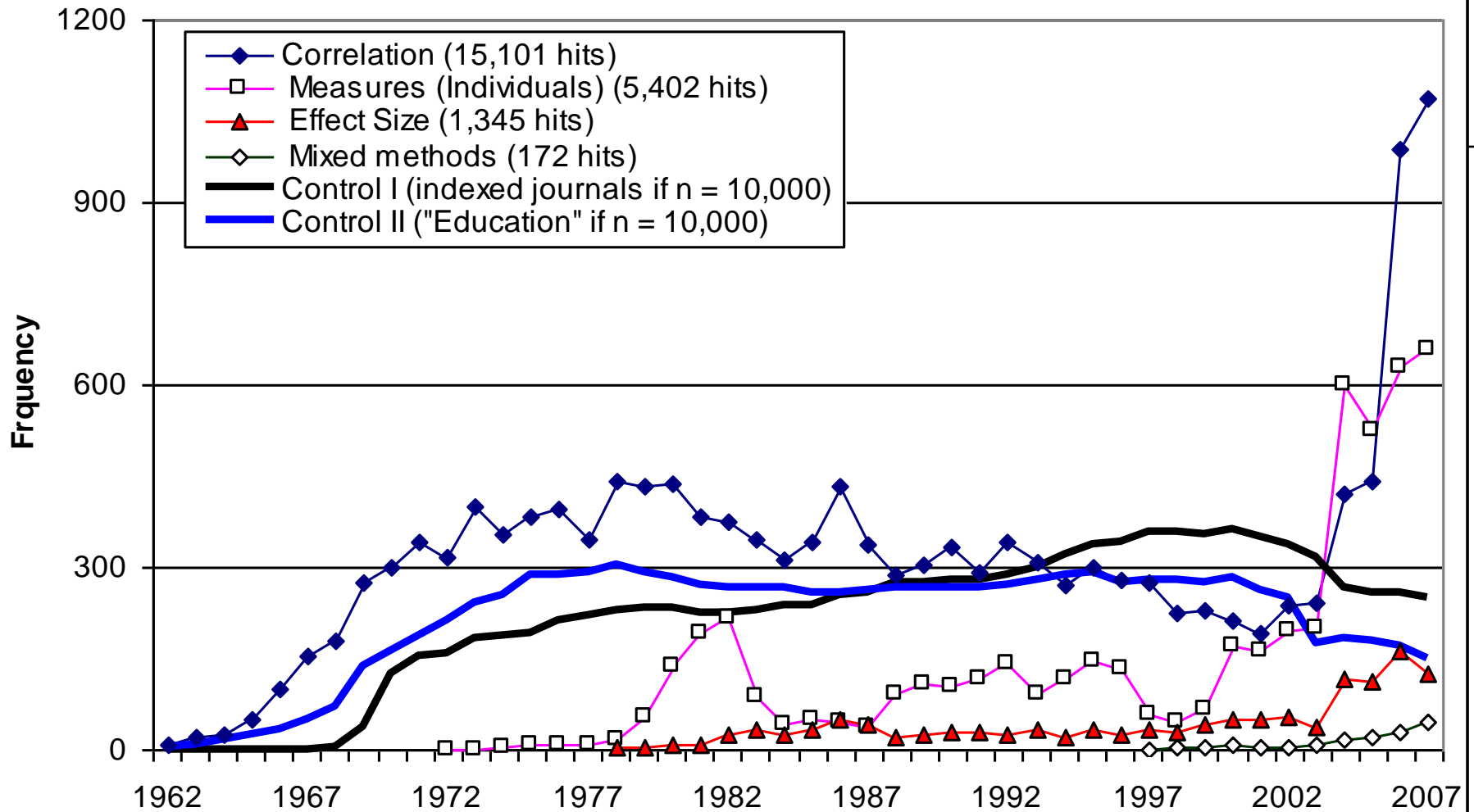
Long-term trends and linear extrapolation of selected themes on the basis of free search in ERiC database



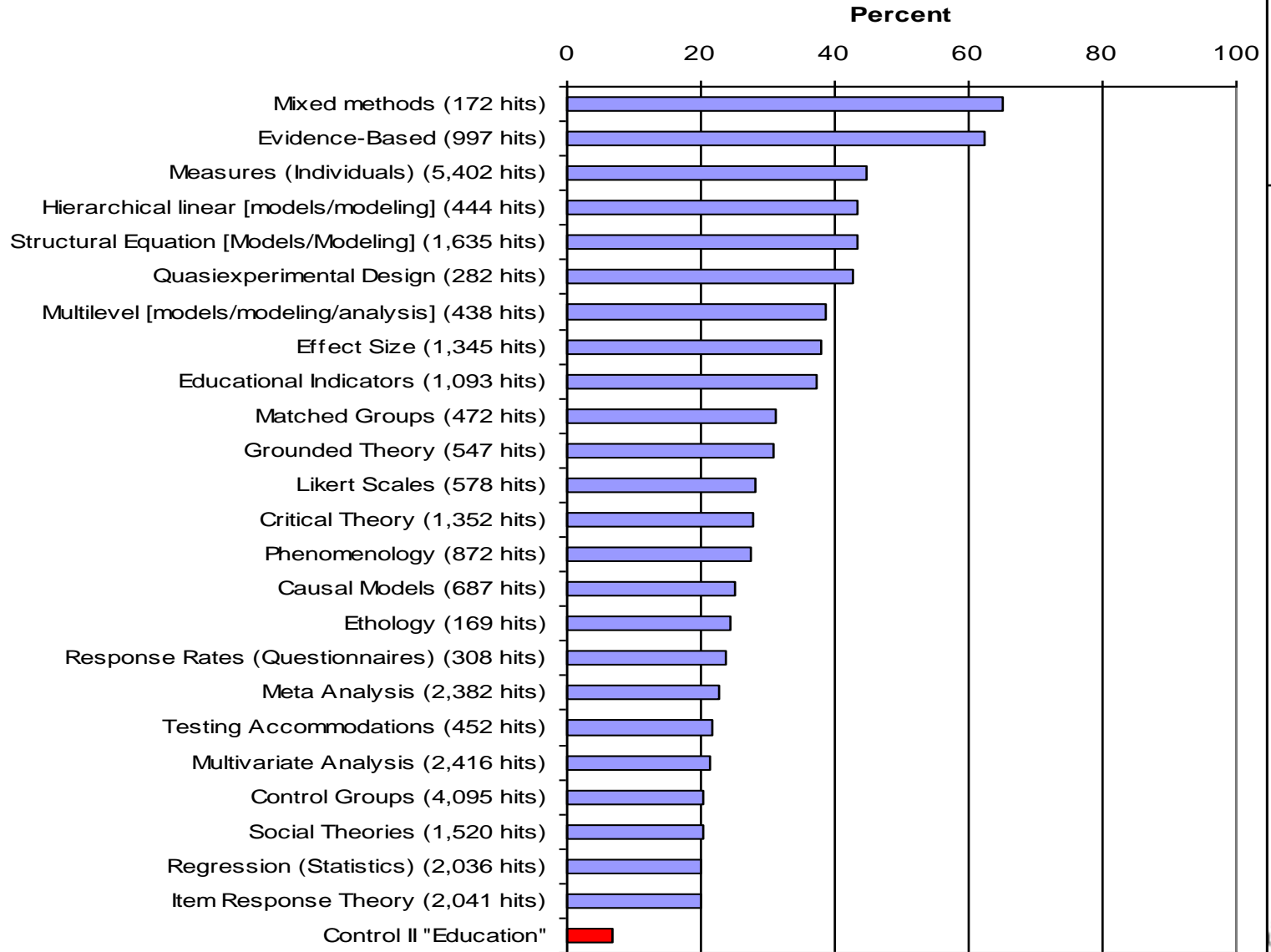
Results IV: Top20 rising methodological themes

1. Include high volume themes: **Correlation** (total of 15,101 hits), **Comparative Analysis** (41,490), **Intervention** (34,276 hits), **Statistical Analysis** (14,047), and **Longitudinal studies** (12,607 hits). These themes may have been taken as a basic fuel for the educational researchers in earlier years. However during the new millennium – for reason or another – their volumes have increased into a new level.
2. Mediocre volumes, long history, radical boost in late 1990's or 2000's: **Measures** (5,402 hits), **Effect Size** (1,345 hits), **Meta Analysis** (2,382 hits), **Structural Equation models/modelling** (1,635 hits), **Educational Indicators** (1,093 hits), and **Grounded Theory** (547 hits).
3. Low volumes, distributions are highly skewed to latest years: **Mixed Methods** (172 hits, 65 % of all the hits located in the period of last four years), **Evidence-Based** (997 hits, 62 %), **Hierarchical linear [models/modelling]** (444 hits, 42 %), **Quasiexperimental Design** (282 hits, 42 %), **Multilevel [models/modelling/analysis]** (438 hits, 41 %), and **Matched Groups** (472 hits, 38 %).

Long-term trends of selected themes on the basis of free search in ERiC database



How many % of hits is located in the latest 4 years' period



Discussion

- Surprisingly and sadly, among the top 23 rising themes there are several topics indicating the concern on modern problems in the schools, “ill-being” of the pupils/students.
- At the same time the theme Qualitative Research is risen also the theme Correlation has rocketed. This may give a hint that mixed methods have made possible the use of correlational designs in a new way.
- The results of the presentation are based on the quantity of the publications. Except the slight additional analysis of the theme Foreign Countries, the results do not tell anything about the quality of the publications.
- The publications examined are published mostly in English media. There are without doubt huge volumes of publications in research communities of, for example, Chinese, Francophone, Germanic, Hindi, Hispanic, or Russian, not to mention other smaller research communities with their native languages.