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21 June 1991

Dear Al:

Good luck on the trip to Turku.

As we discussed yesterday on the phone, here are some comments in regard to Adolf Koch's circular of 30 NOV 90 on Scoring Tables for Multi and Single Events.

One of Koch's contentions is that in multi-event competitions too much credit (too many points) is allowed for mediocre performances by most scoring systems. He feels that competitors should perform well in <u>all</u> events to have a competitive overall score--that if a competitor does poorly in one event, a low score for that event should result which will have a significant impact on the overall score attained.

The basis of this age old argument is who is the better decathlon performer--Athlete A, whose 10 performances (at 1000 points each, max) resulted in 1000, 1000, 1000, 1000, 1000, 1000, 1000, 1000, 1000 and 0 = 9000 points; Athlete B, whose performances were 1000, 1000, 1000, 1000, 1000, 800, 800, 800, 800 and 800 = 9000 points; or Athlete C, whose performances were 900, 900, 900, 900, 900, 900, 900, 900, 900 and 900 = 9000 points. The arguments are many and varied.
There is, however, a sensible, reasonable way to address the problem using performance level measuring systems where PL = Time Standard divided by time run and PL = distance jumped or thrown divided by Distance Standard. If points for mulit-event competitions are determined by multiplying maximum points allowable for each event by PL for each event and totaling, Koch's contention can be met by simply squaring the performance level factor (PL^2 = PL x PL) before multiplying by maximum points allowable for each event. This results in "weighting" the PL factors:

UNWEIGHTED PL FACTOR	WEIGHTED PL FACTOR
1.00	1.0000
0.95	0.9025
0.90	0.8100
0.85	0.7225
0.80	0.6400
0.75	0.5625
0.70	0.4900
0.65	0.4225
0.60	0.3600
0.55	0.3025
0.50	0.2500

Using the weighted performance level factors above, Athlete A would be awarded 9000 points, Athlete B awarded 8200 points, and Athlete C awarded 8100 points. This is, of course, more fair from many points of view.

Changing the subject to track and field standards and performance measuring systems in general, the following addresses fundamental concepts that are involved and suggests choices for the future. Use in Turku if you need to.

Define performance level to be: Time Standard divided by time run for runners, and distance jumped or thrown divided by Distance Standard for field eventers.

Now where do runners time standards and field event distance standards come from?

1. Simplest Concept: Standard is record for each age for every event.

   Basis - All record holders are viewed to have equally good performances.

   Major Flaw in Concept - For running events, older masters age record holders frequently have better (faster) records than younger record holders in the event. For field events, older masters age record holders frequently have better (higher jumps, longer throws) records than younger record holders in the event. It is not fair that a masters age record and standard not be as good for a younger performer as for an older performer.

2. Improved concept: For each event, determine a smooth, continuous curve that best goes through the most age records for the event.

   Basis - Some records are better than others so all records can't fairly be standards. For masters, record performance standards must decrease with age.

Major Flaw in Concept - By independently curve fitting individual events, the phenomenon of curve crossover frequently occurs between neighboring running events, between hurdle events of different heights, and between field events having implements of different weights. Curve crossover, for example, is when the standard for 38 year old putters is less for the 10 pound/5 kg shot than for the 12 pound/6 kg or, for another example, when the standard for 72 year old javelin throwers is farther for the 800 gm spear than for the 600 gm javelin. These are easy to see in the standards charts if standards for all ages are shown. Curve crossover is when the standard for 70 year old hurdlers is faster for the 36 inch 100 meter hurdles than for the 33 inch 100 meter hurdles. These, too, are easy to see if standards for all ages are shown. Curve crossover is when the standards for 80 year old runners results in a faster rate for running the 10 K than for running the 5 K (where rate equals distance divided by time). This is not easy to see unless the resulting rate standards are tabulated.

Precept - The precept here is that runners of the same age do not run longer distances at faster rates than shorter distances; hurdlers of the same age do not run events of the same distance faster for higher hurdles than for lower hurdles; and that field event throwers (putters) of the same age do not throw a heavier implement father than they throw the lighter one.

Conclusion - These undesirable outcomes frequently occur when event curve fitting is accomplished independent of considering curve fitting results for neighboring or similar events. The result is just as unfair as having a running standard easier (slower) for a younger runner than for an older runner.

3. Alternate Improved Concept: Instead of selecting an event and determining a curve through all the age records, select an age and determine a smooth, continuous curve that best goes through the most running event records for that age. Repeat until curves of all events are determined for each age.

Basis - This method establishes time-distance relationships by age and identifies events (distances) having the best performance for each age.

Major Flaw In Concept - By independently curve fitting individual ages, the same undesirable outcomes can occur as were described for the previous concept.

Note: Curves are also determined for hurdle events having the same distance but different hurdle heights, and for each field event having implements of different weight.

4. Complex Concept: Combine the improved concept and the alternate improved concept. Determine a surface that best fits the grid of curves produced by both the improved concept and the alternate improved concept. Drawn in 3-dimensional space on axes of time, distance and age, the two sets of curves are at right angles to each other forming a well-defined grid upon which to determine a time surface.

Basis - All of the previously mentioned undesirable aspects are avoided.

Major Flaw in Concept - It is too perfect and too demanding of performers. While it produces the best possible standards in the absolute sense and allows comparisons of performance to previously unachievable levels of fairness and accuracy, its weakness lies in being subject to complaints of unsuitability based on selected relative comparisons by its witting or unwitting detractors.

Example - Runner A ran a PL of 97% during meet. Runner B set new age world record in another event during meet but had only a PL of 96%. Runner B can't believe Runner A had better performance and neither can many others.

Example - That standard is way out of line--look, it's 10% better than the world age record. The tough standard is probably because curve crossover would occur if the weak age records were used in determining the curve of the standard.

5. In both cases above the tough standards must be used in the absolute sense to get truly fair performance measures. In both cases the weak records could be used in the relative sense, more competitors would be highly rated, and only the very best performers would be disadvantaged by comparison to the watered down performance level results.

6. In-Between Concept: Convert all age world records to age factor values based on event open class world record. Arrange all running events in tabular form by age. Make arbitrary adjustments to age factor values (performance improvements only) so that the values appear to vary smoothly and consistently over the entire chart. Convert age factor standards to time to see what the resulting time standards would be. Repeat, arranging all hurdle events in tabular form by age. Repeat, arranging all field events throws in tabular form by age, and arranging the field event jumps in tabular form by age.

Basis - Good consistency of standards and not too far off actual records.

Major Flaw in Concept - Lacks smoothness of mathematical curve fitting and high validity of mathematical rigor. Surfaces for time (runners) and distances (field events)

would undulate with many peaks and valleys. May be somewhat arguable about where improvements were made.

7. Choices

a. Stay with the rigorous, mathematical standards of the Complex Concept. Educate users on how they are developed and why they are so tough in some areas. If not acceptable to Track & Field community drop down to choice b.

b. Go with In-Between Concept; while the standards are arbitrary, they are arrived at within the surface concept which results in reasonably fair comparisons. If not acceptable to Track & Field community drop down to choice c.

c. Go with Simplest Concept; all standards are existing records. Comparisons are meaningful in a limited relative sense only, i.e., comparisons are meaningful only between performers within the same event. No meaningful comparisons between performers in different events. Competitors in events with weak age world records will always have an edge in comparing performance level percentages with competitors in events which have outstanding age world records.

Charles A. Phillips

Added note on why some specific 1991 standards like the men's 100 meters changed from the 1990 standards.

In general, most changes came about because of some new age records set in 1989 (which are listed in Pete's 1990 version Masters Age Records). Not all 1989 new age records caused changes, only those that resulted in a PL of 100% as listed in tabulation of age records performance level. For example, look up the men's 200 meter record for age 85 in Pete's book and in my 1991 listing of age record performance levels.

Charles Booth (AUS) age 85, 200 meters 29.3! It turns out to be a new super record (100% PL). Because of it, the standards for the 100 meters were also changed. Note that in his 200 meter run, his first or second 100 had to be run in 14.65 or better. That means the 100 meter standard for 85 year olds must be better than 14.65.

NATIONAL MASTERS NEWS

The official world and U.S. publication for Masters track & field, long distance running and race walking.

August 27, 1993

Rex:

Here are new OCs for the LDR events:

	Men	Women
5000	*12:58	14:24
8K	21:15	23:35
10K	*26:58	29:56
12K	32:44	36:20
15K	41:27	46:01
20K	56:26	1:02:38
½	* 59:47	1:06:22
25K	1:11:49	1:19:43
30K	1:27:32	1:37:10
40K	1:59:44	2:12:54
Mara	*2:06:50	2:20:47
50K	2:33:00	2:49:50
100K	5:39:19	6:16:38
10-mile	44:41	49:36

The four asterisked times are the actual world records/bests for the event. The other men's OC's were determined by analyzing the pace-per-kilomter of the four focal points, and projecting similar paces for the others.

The women's OC's were then determined by multiplying the men's OC's by 1.11.

Al

P.S. Do we have to completely redo the women's factors to accommodate our upper-age-group easing? Or can you work with the existing data?

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NATIONAL MASTERS NEWS

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To: Rex Harvey 1-216-531-0038

August 29, 1993
11:30 p.m. PDT

Rex:

Unfortunately, there are still many problems with the lastest tables:

1) There's too much of a difference in the M95 and M100 from 100m to 200m.

2) There isn't much logic to the M95 and M100 100m compared to the 50m and 200m. (i.e., the standards say the M100s will pick up speed from the 50m point to the 100m point, then suddenly slow down significantly from 100m to 200m.)

3) Again, I suggest we print the 100ths of a second for the 600 thru mile.

4) I don't think we can ease the older-age factors differently for men and women. The way it is now, the women's standards are, percentage-wise, increasingly easier than the men's (as they should be) up to about age 80, when they become progressively tougher -- because of the formulas you used. This makes the upper-age standards inconsistent. We will be rightly criticized if we leave them as is.

5) In some cases, the women's factors at age 100 are even higher than the M100 factors.

6) Thus, I strongly recommend that we use the same formula for the upper-age groups for the women as for the men.

7) I experimented with using your men's formula (where the Delta 5 goes from 0 to 1 from age 70 to 75, and to 2 from age 75 to 80, etc.) for the women's 1500 and 3000. Regrettably, it doesn't work. I get 15:21 for the W100 standard at 1500, and 30:36 for the W100 standard at 3000.

8) Therefore, I suggest that, since the women's standards work as presently done (August 29 tables), why not use the same formula for the men (namely, Delta 5 goes to 1 from age 75 to 80, to 2 from 80 to 85, etc.)

9) If you don't approve of that, then I'll have to go back to the drawing board on the women's Delta 1s. If I do that, however, it means toughening the women's standards across the board. I think we'll get far more criticism from the women (and others) for being too tough than we will from Adolph Koch for not easing the older men's factors. I would hope you could use the suggested formula (#8) and convince Koch that you tried your best to ease the older men's standards, even though the easing won't be significant until age 85 or so. Blame it on me, if you want.

10) Frankly, even now the difference between the April 5 standards and the August 29 standards at age 80 and 85 isn't that great. (e.g. the 400 at age 80 on April 5 was 68.65; now it's 68.73; the 400 standard at age 85 on April 5 was 75.18; now it's 75.56.) So it seems to me we're dealing with minutiae here in low-populated age groups, while risking the integrity of our entire effort.

11) In conclusion, I would be happy to leave the formula the way it was on April 5th. But if not that, then let's use your current women's formula for the men as well.

(more)

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12) I would also suggest using the women's formula gradually for the 100m and 200m. In other words, if we do the 400+ with a Delta 5 of 1 from age 75 to age 80, we can do the 200 the same way, and the 100 with a Delta 5 of 1 from age 80 to 85. That would work; it brings the age-89 100m standard to 16.73 (compared to 16.70 on the August 29 tables). Since Maclean's WR at age 89 is 16.5 (16.74 auto), that's okay.

13) Doing that also helps solve the problems mentioned in items #1 and #2.

P.S. By the way, we have another problem which is probably unsolvable at this point. Linford Christie ran the 100 in Stuttgart at age 33 in 9.87. That's 101.5%. To correct that would mean starting over on the sprints. I don't think we have the time or energy to do that.

OC	100					1500						3000					100, using women's female				
30	10000																				
35	9738	262				9749	332					9889									
40	9474	264	2			9415	334	2				9555	334								
45	9206	268	4			9077	338	4	2	1	0	9217	338								
50	8931	275	7			8732	345	7	3	1	0	8872	345								
55	8645	286	11			8376	356	11	4	1	0	8516	356								
60	8343	302	16			8004	372	16	5	1	0	8144	372								
65	8019	324	22			7610	394	22	6	1	0	7750	394	22	6						
70	7666	353	29	7		7187	423	29	7	1	0	7327	423	29	7	1		7666	353	29	7
75	7275	390	38	9		6726	461	38	9	2	1	6866	461	38	9	2		7276	390	37	8	1
80	6833	442	51	13		6214	512	51	13	4	2	6354	512	51	13	4		6839	437	47	10	2
85	6319	514	72	21		5630	584	72	21	8	4	5770	584	72	21	8		6341	498	61	14	4
90	5696	623	109	37		4937	693	109	37	16	8	5077	693	109	37	16		5760	581	83	22	8
95	4895	801	178	69		4066	871	178	69	32	16	4206	871	178	69	32		5058	702	121	38	16
100	3783	1112	311	133		2884	1182	311	133	64	32	3024	1182	311	133	64		4165	893	191	70	32

DOESN'T WORK

WOC	8/29 1500					PROJECTED 1500						PROJECTED 3000					100, using Delta 4.5 1 at age 85				
30																					
35	9749					9749	360					9889									
40						9387	362	2				9531	358	2							
45						9021	366	4				9169	362	4							
50						8648	373	7				8800	369	7							
55						8264	384	11				8420	380	11							
60			16			7864	400	16				8024	396	16							
65	7442		22	6	1	7442	422	22				7606	418	22							
70	6991	451	29	7	1	6991	451	29				7159	447	29				7666	353	29	7
75	6503	488	37	8	1	6502	489	38	9			6674	415	38				7276	390	37	8
80	5968	535	47	10	2	5962	540	51	13			6138	536	51				6840	436	46	9
85	5372	596	61	14	4	5350	612	72	21			5530	608	72				6347	493	57	11
90	4693	679	83	22	8	4629	721	109	37			4813	717	109				5782	565	72	15
95	3893	800	121	38	16	3730	899	178	69			3918	895	178				5122	660	95	23
100	2902	991	191	70	32	2520	1210	311	133			2712	1206	131				4128	994	134	39

15,21 30,36

Doesn't work