

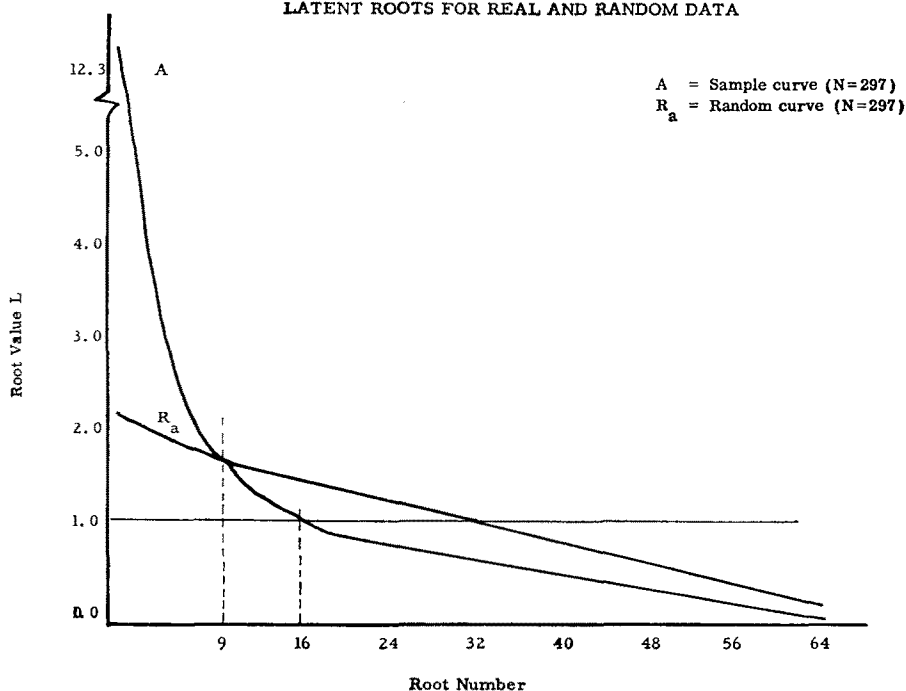
roots were calculated. The roots are listed in Table 1 and portrayed graphically in Fig. 2.

In the real data, 16 of the roots are greater than 1.0. If the results giving the curve R_n are accepted at face value, however, and the rationale outlined above is used, only nine factors would be indicated. Interestingly, there is something of an inflection in the real data curve at this point. The ratio of the tenth root to the ninth is small. Some rules for when to stop factoring are, in effect, based on the assumption that there should be a rather

TABLE 1
Latent Roots for Random and Real Data

Root Number	Real Data Root	Random Data Root	Root Number	Real Data Root	Random Data Root
1	12.29	2.10	34	.55	.90
2	4.86	1.95	35	.53	.87
3	3.75	1.91	36	.52	.85
4	2.83	1.83	37	.51	.83
5	2.14	1.76	38	.49	.81
6	1.84	1.72	39	.48	.80
7	1.78	1.67	40	.47	.79
8	1.69	1.64	41	.45	.75
9	1.62	1.61	42	.44	.75
10	1.39	1.56	43	.42	.73
11	1.33	1.54	44	.40	.71
12	1.25	1.52	45	.39	.67
13	1.21	1.50	46	.38	.66
14	1.15	1.42	47	.38	.65
15	1.09	1.40	48	.36	.63
16	1.03	1.38	49	.34	.62
17	.98	1.34	50	.32	.60
18	.96	1.31	51	.31	.59
19	.92	1.28	52	.30	.58
20	.88	1.25	53	.30	.56
21	.85	1.23	54	.27	.54
22	.80	1.18	55	.27	.51
23	.79	1.17	56	.24	.50
24	.77	1.11	57	.22	.49
25	.76	1.10	58	.21	.47
26	.73	1.07	59	.19	.46
27	.70	1.07	60	.19	.42
28	.68	1.03	61	.18	.40
29	.66	1.01	62	.18	.40
30	.64	1.00	63	.16	.36
31	.63	.99	64	.14	.32
32	.62	.92	65	.13	.31
33	.59	.91			

FIGURE 2
LATENT ROOTS FOR REAL AND RANDOM DATA



sudden drop in the variance accounted for by a factor after the last *true* factor has been calculated. In the present case, application of this kind of rule leads to the estimation of the same number of factors as is suggested by the method developed in this paper. While this is an interesting outcome and suggests a hypothesis to be examined, the results here are not presented as a test of the hypothesis of congruency of the two approaches. Such a test would require variation over several samples of real data as well as variation over several samples of random variables.

It is to be hoped, of course, that the sampling theory required by the rationale given here will soon be developed to the point where the generation of samples of random variables will not be needed. Meanwhile, however, the procedures illustrated above can be rather easily adopted at any institution where fast computer facilities are available. The test based on random variables can be included in standard programs and used routinely.

REFERENCES

- [1] Anderson, T. W. *An introduction to multivariate statistical analysis*. New York: Wiley, 1958.
- [2] Dickman, K. W. Factorial validity of a rating instrument. Unpublished doctoral dissertation, Univ. Illinois, 1960.