

FACTOR ANALYSIS OF 1970-71 VERSION OF THE
COMPARATIVE GUIDANCE AND PLACEMENT
BATTERY

JOSEPH GRIMALDI

Marymount College, Tarrytown, New York

EUGENE LOVELESS, JAMES HENNESSY, AND JOHN PRIOR

Queensborough Community College

The City University of New York

THE Comparative Guidance and Placement Program (CGP) is a multi-purpose battery published by the College Entrance Examination Board (CEEB). The battery, which includes biographical, interest, ability and achievement measures, was designed primarily for use at community and two-year colleges. Lunneborg, Greenmun, and Lunneborg, (1970) reported a factor analysis of the 1967 version of CGP. However, the 1970-71 version of the CGP differs in composition from the 1967 version. Consequently, previous factor studies are somewhat outdated.

Purpose and procedure. The 1970-71 version of the CGP battery served as the basis of the present factor analytic investigation. The battery was administered to the freshman class of Queensborough Community College entering in the Fall of 1970 ($N = 1637$). The battery was scored by Educational Testing Service (ETS). The 11 interests scales and the eight cognitive scales were then factor analyzed through utilizing a principal components solution followed by rotation to the Varimax criterion. Unities were placed in the diagonal cells of the test intercorrelation matrix. All principal components that had associated eigenvalues equal to or greater than one were retained for rotation.

Results. Table 1 contains the test intercorrelation matrix. Decimal points have been omitted.

Table 2 furnishes the rotated factor solution. Communalities as well as eigenvalues have been reported. Decimal points have been omitted except for the eigenvalues. The six-factor solution accounted for 70 per cent of the total variance. Factor I was primarily defined by the cognitive scales with the exception of Mosaics. Factors II, III, and IV were primarily (although not completely) defined by interest scales. Biology, Health, and Physical Sciences defined Factor II; Secretarial, Business, Home Economics, and Academic Motivation were loaded on Factor III; and Mathematics, Physical Sciences, Engineering Technology and Social Sciences were weighted on Factor IV. Factor V was also described by cognitive scales—specifically, Mosaics, Letter Groups, Mathematics, and the Year 2000. The remaining interest scales defined Factor VI.

Discussion. Factor I has been interpreted as a scholastic aptitude factor. It apparently encompassed the ability to cope with school tasks (i.e., reading, vocabulary, sentences, mathematics) as well as the ability to follow verbal directions and solve a problem (Year 2000). The Letter Groups test also was loaded on this factor but at a slightly lower level (.45). The latter finding is consistent, since the Letter Groups test is a more nearly pure measure of general reasoning ability than are the other tests that were loaded on this factor. Hence the Letter Groups test was less susceptible to scholastic influences than were other measures.

Factor II was primarily defined by the Biology and Health interest scales. It seemed to represent both theoretical and applied aspects of the Biology-Health domain. Factor III was primarily defined by the Secretarial and Business interest scales and by the Academic Motivation scale. This pattern of loadings suggested an interpretation of this factor, viz., Practical Interest. The factor bore a similarity to the Practical Outlook scale of the Omnibus Personality Inventory (Heist and Yonge, 1968). Factor IV was primarily defined by the Engineering Technology interest scale. An interpretation of this factor as Interest in Technological Science would appear consistent with the presence of the other variables that also were weighted on this factor, viz., Physical Science and Mathematics interest scales.

TABLE 1
Test Intercorrelation Matrix of the 1970-1971 Version of the CGP Battery

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Interest Scales																				
1. Mathematics	-	41	34	15	12	07	17	29	18	07	06	-01	-06	-03	29	02	09	09	16	
2. Physical Sc.		-	62	58	35	-04	-08	17	27	18	23	09	-09	08	13	-02	03	-07	07	
3. Engineering			-	22	09	-07	-01	19	11	24	20	03	12	03	13	02	07	-03	-03	
4. Biology				-	67	31	-02	07	21	35	26	10	06	10	04	01	04	02	10	
5. Health					-	36	08	08	08	27	20	-01	01	-01	-03	-03	00	00	17	
6. Home Eco.						-	48	38	08	45	19	02	16	02	07	01	04	09	23	
7. Secretarial							-	72	07	15	04	-10	-01	-11	-12	-07	-01	00	23	
8. Business								-	34	10	10	-06	-06	-06	-08	-09	-03	-08	19	
9. Social Sciences									-	26	30	20	08	20	07	06	-03	-03	05	
10. Fine Arts										-	45	12	13	12	-01	04	09	09	09	
11. Music											-	10	08	10	-01	-01	-03	00	05	
Cognitive Scales																				
12. Reading													90	50	56	52	18	35	-20	
13. Sentences													-	60	55	50	17	35	-21	
14. Verbal														-	53	49	23	49	-10	
15. Mathematics															-	54	31	52	-15	
16. Year 2000																-	37	47	-21	
17. Mosaics																	-	37	-02	
18. Letter Groups																		-	-05	
19. Academic Motivation																			-	

TABLE 2

Primary Factor Loadings of CGP Variables for 1970 QCC Freshman Class Using the Varimax Solution

Variable	I	II	III	Factor IV	V	VI	h^2
Interest Scales							
Math	-.01	.06	.31	.69	-.19	-.11	.63
Phy. Sc.	.05	.42	-.08	.79	.13	.12	.83
Eng.	-.06	.00	-.06	.78	-.06	.25	.69
Bio.	.09	.84	-.03	.26	.06	.23	.83
Health	-.02	.89	.08	.06	.01	.07	.80
Home Ec.	.01	.43	.56	-.27	-.17	.36	.73
Sect.	-.06	-.02	.90	-.04	-.01	.05	.81
Bus.	.01	-.06	.84	.28	.19	.05	.83
Soc. Sc.	.31	-.02	.25	.31	.38	.37	.53
Fine Arts	.03	.19	.13	.05	-.16	.83	.76
Music	.05	.09	-.01	.13	.09	.78	.65
Cognitive Scales							
Read.	.90	.02	-.07	.03	.02	.08	.82
Verbal	.91	.03	-.08	.01	.02	.09	.85
Sentences	.74	.07	.05	-.21	-.27	.08	.68
Math	.63	-.03	-.06	.29	-.43	-.15	.70
Yr. 2000	.68	-.05	-.05	.02	-.40	-.02	.62
Mosaics	.15	-.03	-.01	.11	-.73	.07	.57
Lett. Grps.	.45	.01	.04	-.03	-.65	.00	.63
Academic Motivation	-.28	.27	.39	.00	-.11	-.01	.32
Eigenvalues	3.96	3.28	1.99	1.63	1.36	1.05	13.27
Per Cent of Variance	21	17	11	08	07	06	70

Factor V appeared to be a combination of measures. It was primarily defined by tasks of nonverbal reasoning nature (e.g. Mathematics, Year 2000, and Letter Groups) as well as by a measure of perceptual efficiency (Mosaics). Tentatively, this factor might be defined as a Perceptual-Reasoning factor. However, the inter-relationship of the tests that were loaded on Factor V as well as their relationship to external criteria bears further investigation.

In summary, the CGP battery was found to yield six interpretable factors. Two of these factors were related to the cognitive tests and four were related to the interest measures. The pattern of loadings split very neatly according to content (i.e., interest vs. cognitive). It would, therefore, seem more profitable if future factor analytic studies divided the battery into portions prior to factoring. The only measure in the battery that could not unequivocally be placed in one or the other category was the Aca-

demic Motivation scale. Therefore, future studies should include the Academic Motivation scale with both groups of tests.

REFERENCES

- Heist, P. and Yonge, G. *Omnibus Personality Inventory: Form F*, Manual. New York: The Psychological Corporation, 1968.
- Lunneborg, C. E., Greenmum, R., and Lunneborg, P. W. A factor analysis of the core elements of the CEEB Comparative Guidance and Placement Battery. *EDUCATIONAL AND PSYCHOLOGICAL MEASUREMENT*, 1970, 30, 387-392.