

# A Report on Cognitive Style of All Year One Students at HKSYU (2010 Sept)

## **Introduction**

*“How can we teach students if we do not know how they learn?  
How can we improve the performance of our employees if we do  
not know how we ourselves learn or how to enhance their  
learning?...There is a strong intuitive appeal in the idea that  
teachers and course designers should pay closer attention to  
students’ learning styles – by diagnosing them, by encouraging  
students to reflect on them and by designing teaching and  
learning interventions around them.”*

*Coffield, Moseley, Hall & Ecclestone, 2004*

During the past decade, there has been an increasing interest in cognitive style among academic researchers and practitioners. While learning effectiveness depends on the contingent fit of cognitive styles with instructional methods, the acknowledgement of the different cognitive styles allows individuals to search for the best match learning mode to suit his or her individual needs. The objective of the study is to measure the cognitive styles of all new students in order to provide an overall picture to the college. The college administration will benefit from such an understanding in order to devise development plans; teaching faculties will be able to devise specific teaching strategies in courses; while students will understand more of themselves in selecting the best learning mode. The study of cognitive styles and its implications for teaching and learning are serious and should be concern to learners, teachers and trainers, managers, researchers and inspectors (Coffield et al., 2004).

## **Cognitive Style**

Cognitive style has been defined as ‘*consistent individual differences in preferred ways of organizing and processing information and experience*’ (Messick, 1976, p.5). Researchers suggest that cognitive styles are actually converged to two poles which are commonly labeled ‘analytic’ and ‘intuitive’, and often associated with the specialist functions performed by each hemisphere of the human brain.

### *Analytic*

Rational type of information processing has been linked with the left brain. The

left hemisphere is held to be mainly responsible for logical thought, particularly in verbal and mathematical functions. In the work context, an analytic person would tend to be compliant, prefer a structured approach to decision making, apply systematic methods of investigation and be especially comfortable when handling problems requiring a step by step solution.

### *Intuitive*

Nonlinear thinking has been identified with the right brain. The right hemisphere specializes in synthesis and the simultaneous integration of inputs, with an emphasis on spatial orientation and the comprehension of visual images.

### **Important Implications to Pedagogy and Work Context**

There are several implications for pedagogy. It is suggested that matched styles are often effective in mentoring relationships. Analytic qualities in university dissertation supervisors are desirable. If it were to be shown that placing a higher value on intuitive performance by university students led to more successful career and business outcome, changes in pedagogy and assessment would be indicated.

In the work context, an analytic person would tend to be compliant, prefer a structured approach to decision making, apply systematic methods of investigation and be especially comfortable when handling problems requiring step by step solution.

An intuitive individual would tend to be relatively nonconformist, prefer a rapid, open-ended approach to decision making, rely on random methods of exploration and work best on problems favoring a holistic approach (Lynch, 1986).

Other studies also found that differences in cognitive style may fundamentally affect the nature of interpersonal relationships (e.g., Witkin et al. 1977) where cognitive similarity will lead to smoother interaction and positive mutual feeling between individuals owing to shared interests, common personality attributes and equivalent modes of communication. Conversely, mismatching on cognitive style is more likely to result in conflict (e.g., Goodenough et al., 1974; Kubes, 1992; Lindsay, 1985; Mchale & Flegg, 1985; Richards & Moger, 1994; Tullet, 1995) as differences in style yield differences in interests, values and problem-solving techniques which may handicap a working relationship (e.g., Lawrence, 1993). It has been observed that people who are highly adaptive in their cognitive style do not readily combine with those who are highly innovative (e.g., Kirton, 1989). Adaptors appear to see innovators as being abrasive and insensitive while innovators seem to regard the more extreme adaptors as being more likely to reject them and their ideas than collaborate.

## Method

### *Sample*

The sample comprised all year one students in all academic disciplines in HKSYU. In the last five years, at the beginning of the academic term in September, all new students were distributed a questionnaire asking them to complete and return, through the Office of Student Affairs (OSA). As at September, 2010, a total of 1,316 new students registered in the University, of whom 1,305 participated in the survey. Among them, 1270 completed all questions in the survey, with a response rate of 96.50 per cent (compared to 98.07, 94.35, 97.72, 97.6, 93.4 per cent in 2009, 2008, 2007, 2006, 2005 respectively).

### *Measures*

The Cognitive Style Index (CSI) (Allinson & Hayes, 1996), a self-report questionnaire, was administered to all year one students in order to assess the generic, intuitive-analytic dimension of cognitive style described above. Each of the 38 items has a true-uncertain-false response mode, and score of 2, 1, or 0 are assigned to each response, the direction of scoring depending upon the polarity of the item (17 having been reversed to control for acquiescence response bias). The nearer the total score to the theoretical maximum of 76, the more analytical the respondent, and the nearer to the theoretical minimum of zero, the more intuitive the respondent. The internal consistency of the 38-items CSI is measured with reliability alpha coefficient ( $\alpha=0.7427$ ) which exceeds the minimum threshold ( $\alpha=0.7$ ) suggested by literature (Nunnally & Berstein, 1974) (compared to  $\alpha=0.7372$ , 0.7349, 0.743, 0.702, 0.722 in 2009, 2008, 2007, 2006, 2005 respectively).

## Data Analysis

### *Descriptive Statistics*

The overall mean for the 38 question items is 46.20 (compared to 46.53, 46.33, 46.05, 45.78, 44.36 in 2009, 2008, 2007, 2006, 2005 respectively), with a standard deviation of 8.524 (compared to 8.407, 8.310, 8.408, 7.936, 8.064 in 2009, 2008, 2007, 2006, 2005 respectively). The minimum score and the maximum score are 18 and 70, compared to 14 and 68 in 2009, 15 and 68 in 2008, 14 and 71 in 2007, 17 and 70 in 2006; 12 and 68 in 2005. The figures are summarized in Table 1 below.

Table 1. Descriptive Analysis

CSI scores	Mean	Min	Max	Variance	Standard	Cronbach's	N
(N of items=38)					Deviation	Alpha	

2010	46.20	18	70	72.660	8.524	0.743	1270
2009	46.53	14	68	70.679	8.407	0.737	1267
2008	46.33	15	68	69.052	8.310	0.735	1203
2007	46.05	14	71	70.688	8.408	0.743	1245
2006	45.78	17	70	62.980	7.936	0.702	1180
2005	44.36	12	68	65.023	8.064	0.722	816

### *Median Splits*

Distinguish high (analytic) and low (intuitive) scores by splitting the group respectively according to their CSI median would have been arbitrary and without theoretical justification. It was decided that it would be more valid to adopt as the criterion of split the median score (mdn=43) previously obtained for a relatively large sample (Allinson, Armstrong & Hayes, 2001) from the general work population as a notional boundary between analytic and intuitive thinking. Thus, CSI scores were designated low (intuitive) if they were <43 and analytic if they were ≥43. This finally creates two groups, the intuitive group with 403 students while the analytic group with 867 students.

Table 2. Cognitive Styles

	Cognitive Style		N
	Intuitive	Analytic	
2010	403 (30.9%)	867 (66.4%)	1270
2009	376 (29.7%)	891 (70.3%)	1267
2008	367 (30.5%)	836 (69.5%)	1203
2007	390 (31.3%)	855 (68.7%)	1245
2006	392 (33.2%)	788 (66.8%)	1180
2005	316 (38.7%)	500 (61.3%)	816

### **Discriminating Groups**

CSI is capable of discriminating between groups which are presumed to differ in their cognitive style. Areas for comparison can be gender (e.g., Agor, 1986; Kirton, 1989); age; academic discipline, etc. Cross Tabulation analysis shows the distribution of cognitive styles among gender, age and departmental groups.

Table 3a. Gender versus CSI\_Group Crosstabulation (2010)

		CSI Group		
		Intuitive	Analytical	Total
Gender	Male	115 (9.07%)	294 (23.19%)	409 (32.26%)

	Female	288 (22.71%)	571 (45.03%)	859 (67.74%)
Total		403 (31.78%)	865 (68.22%)	1268* (100%)

*\*2 not reported gender*

Table 3c. Gender versus CSI\_Group Crosstabulation (2005-2010)

	Intuitive			Analytic		
	Male	Female	Sub-total	Male	Female	Sub-total
2010	9.07	22.71	31.78	23.19	45.03	68.22
2009	10.34	19.34	29.68	22.41	47.91	70.32
2008	10.64	19.87	30.51	22.03	47.46	69.49
2007	10.36	20.96	31.32	22.09	46.59	69.68
2006	13.70	19.50	33.20	27.40	39.40	66.80
2005	16.50	22.20	38.70	26.00	35.30	61.30

Table 4a. Age versus CSI Group Crosstabulation (2010)

	Age	CSI Groups		
		Intuitive	Analytic	Total
	16	0	1	1
	17	0	3	3
	18	78	145	223
	19	193	434	627
	20	93	184	277
	21	27	77	104
	22	10	19	29
	23	0	1	1
	24	2	1	3
	Total	403	865	1268

*\*2 not reported age*

Table 5a. Cognitive Styles in Departments (2010)

Department (Code)	CSI Groups		Total
	Intuitive	Analytic	
History (0)	24	52	76
Chinese Lang. & Lit. (1)	24	46	70
English Lang. & Lit. (2)	23	42	65
Business Administration (3)	70	171	241
Accounting (4)	39	127	166
Journalism & Communication (5)	68	101	169
Sociology s (6)	42	88	130
Law and Business (7)	20	36	56
Counseling and Psychology (8)	29	63	92
Economics & Finance (9)	36	86	122
Psychology p (10)	12	32	44
Cooperative Programme (11)	3	1	4
Social Work (65)	13	22	35
<b>Total</b>	<b>403</b>	<b>867</b>	<b>1270</b>

Table 5b. Cognitive Styles in Departments (2005-2010)

	Intuitive						Analytical					
	10	09	08	07	06	05	10	09	08	07	06	05
History	24	19	16	16	12	2	52	56	51	38	25	11
Chinese Lang. & Lit.	24	19	14	22	22	12	46	48	48	37	51	25
English Lang. & Lit.	23	20	21	20	19	17	42	47	40	47	39	15
Business Administration	70	58	73	73	88	71	171	183	159	170	199	135
Accounting	39	27	36	39	30	35	127	134	122	123	127	103
Journalism & Communication	68	83	71	75	67	58	101	93	85	90	87	72
Sociology	42	27	37	34	52	45	88	88	73	92	91	44
Law and Business	20	15	11	19	1	4	36	45	45	42	4	6
Counseling and Psychology	29	37	35	27	40	30	63	58	62	65	78	41
Economics & Finance	36	39	28	32	33	9	86	79	85	91	46	10
Psychology	12	17	9	15	0	0	32	25	33	25	0	0
Cooperative Programme	3	5	6	2	6	7	1	11	9	8	6	10
Social Work	13	10	10	16	22	26	22	24	24	27	35	28
<b>Total</b>	<b>403</b>	<b>376</b>	<b>367</b>	<b>390</b>	<b>392</b>	<b>316</b>	<b>867</b>	<b>891</b>	<b>836</b>	<b>855</b>	<b>788</b>	<b>500</b>

## References

- Agor, W.H. (1986). *Intuitive Management: Integrating Right and Left Brain Management Skills*. Englewood Cliffs, NJ: Prentice-Hall.
- Allinson, C.W. & Hayes, J. (1996). The Cognitive Style Index: A Measure of Intuitive-Analysis for Organizational Research. *Journal of Management Studies*, 33, pp.119-135.
- Allinson, C.W., Armstrong S.J. & Hayes, J. (2001). The Effects of Cognitive Style on Leader-Member Exchange: A Study of Manager-Subordinate Dyads. *Journal of Occupational and Organizational Psychology*, 74, pp.201-220.
- Coffield, F., Moseley, D., Hall, E., & Ecclestone, K. (2004). *Learning Styles and Pedagogy in Post-16 Learning: A Systematic and Critical Review*. The Learning and Skill Research Centre: London.
- Goodenough, D.R., Witkin, H.A., Lewis, H.B., Koulak, D., & Cohen, H. (1974). Repression, Interference and Field-dependence as Factors in Dream Forgetting. *Journal of Abnormal Psychology*, 83, pp.33-44.
- Kirton, M. (1989). A Theory of Cognitive Style. In M. Kirton (Ed.), *Adaptors and Innovators* (pp.7-27). London: Routledge.
- Kubes, M. (1992). Cognitive Style and Interpersonal Behavior: The Kirton Adaptation-Innovation and Schutz's FIRO-B Inventories. *Psychology: A Journal of Human Behavior*, 29, pp.33-38.
- Lawrence, G. (1993). *People Types and Tiger Stripes: A Practical Guide to Learning Style*. Gainsville, FL: Centre for Applications of Psychological Type.
- Lindsay, P. (1985). Counselling to Resolve a Clash of Cognitive Styles. *Technovation*, 3, pp.57-67.
- Lynch, D. (1986). Is the Brain Stuff Still the Right (or Left) Stuff? *Training and Development Journal*, February, pp.23-26.
- McHale, J. & Flegg, D. (1985). How Calamity Jane was Put in Her Place. *Transition*, November, pp.14-16.

- Messick, S. (1976). Personality Consistencies in Cognition and Creativity. In S. Messick (Ed.), *Individuality in Learning* (pp.4-22). San Francisco, CA: Jossey Bass.
- Nunnally, J.C. & Berstein, I.H. (1974). *Psychometric Theory*, McGraw-Hill: NY.
- Richards, T., & Moger, S. (1994). Felix and Oscar Revisited: An Exploration of the Dynamics of a Real-life Odd Couple Work Relationship. *Journal of Applied Behavioral Science*, 30, pp.108-131.
- Tullet, A.D. (1995). The Adaptive-Innovative (A-I) Cognitive Styles of Male and Female Project Managers: Some Implications for the Management of Change. *Journal of Occupational and Organizational Psychology*, 69, pp.359-365.
- Witkin, H.A., Moore, C.A., Goodenough, D.R., & Cox, P.W. (1977). Field-dependent and Field-independent Cognitive Styles and Their Educational Implications. *Review of Educational Research*, 47, pp.1-64.

**Appendix I: Norms and Reliability Data for the Cognitive Style Index**

<i>Sample</i>	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>Alpha</i>	<i>Test-retest</i>
Nepalese managers	39	48.07	7.04	.56	
Jordanian managers	38	48.05	8.96	.73	
Workshop participants	22	46.67	16.13	.92	
Electronics operatives	64	46.53	14.03		
Hong Kong students (All year one undergraduate students in all disciplines in HKSYU in 2009)	Distributed to 1292 (1267 completed; 98.07% response rate)	46.53	8.407	.74	
Hong Kong students (All year one undergraduate students in all disciplines in HKSYU in 2008)	Distributed to 1275 (1203 completed; 94.35% response rate)	46.33	8.310	.73	
Hong Kong students (All year one undergraduate students in all disciplines in HKSYU in 2007)	Distributed to 1274 (1245 completed; 97.7% response rate)	46.05	8.408	.74	
Hong Kong students (All year one undergraduate students in all disciplines in HKSYU in 2006)	Distributed to 1209 (1180 completed; 97.6% response rate)	45.78	7.936	.70	
Financial managers	13	45.46	13.06		
Hong Kong students (All year one undergraduate students in all disciplines in HKSYU in 2005)	Distributed to 874 (816 completed; 93.4% response rate)	44.36	8.064	.72	
Russian managers	71	44.06	9.64	.78	
Indian managers	59	43.83	12.27	.85	
Engineering operatives	78	43.36	11.25		
Brewery managers	226	43.26	12.11	.84	
Teachers	74	42.54	13.47	.85	
Canadian students	89	42.50	11.80	.83	.89 (n = 79)
Health visitors (female)	39	42.13	12.78	.86	

Engineering managers	78	42.03	7.92		
Business Admin. students	101	41.74	13.00	.82 (n = 65)	.78 (n = 19)
Business students	202	41.64	12.19	.86	
Singaporean managers	81	41.61	12.89	.85	
Hong Kong students	31	41.52	10.91	.83	
Production managers	17	40.59	9.89		
Marketing managers	26	40.42	12.62		
Management students	128	40.38	13.23	.88	
Management students	225	40.32	15.18	.91	.90 (n=30)
University lecturers	11	39.64	9.10		
Miscellaneous managers	130	39.48	7.08	.85	
Construction managers	66	38.98	14.21	.89	
Australian students	85	38.59	11.57	.83	
IT managers	40	38.28	12.09		
Human Resource managers	136	37.89	14.05	.89	
French students	80	37.79	9.81	.77	
Electronics managers	64	37.39	14.25		
German students	36	35.64	11.41	.83	
British managers (MBA students)	106	33.26	14.07	.89	
Personnel managers	15	31.07	12.49		

**Appendix II: Descriptive Statistics for the CSI score distribution**

		2009	2008	2007	2006	2005
N	Valid	1267	1203	1245	1180	816
	Missing	25	36	29	29	58
Mean		46.53	46.33	46.05	45.78	44.36
Std. Deviation		8.407	8.310	8.408	7.936	8.0644
Variance		70.679	69.052	70.688	62.977	65.023
Skewness		-.429	-.412	-.371	-.211	-.348
Std. Error of Skewness		.069	.071	.069	.071	.086
Kurtosis		.432	.272	.280	.092	.224
Std. Error of Kurtosis		.137	.141	.139	.142	.171
Minimum		14	15	14	17	12
Maximum		68	68	71	70	68