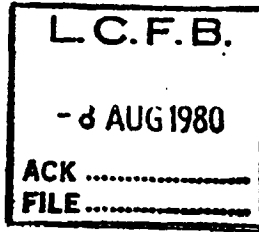


MO/WBL/46E



7th August 1980

A DELTA PANEL EVALUATION OF SOME CANADIAN BRANDS

The GR&DC DELTA panel was required to undertake an evaluation of the following Canadian brands, supplied by Imperial Tobacco Ltd:

<u>No.</u>	<u>Brand</u>	<u>Tar/Nic</u> (mg.)
1.	Players Extra Light	9.0/0.9
2.	Matinee	8.0/0.5
3.	Coded 410 "Joy"	* *
4.	Peter Jackson Extra Light	7.0/0.7
5.	Medallion Ultra Mild	1.0/0.1
6.	Craven A Ultra Light	1.0/0.1
7.	Craven A Special Mild	4.0/0.4
8.	Accord Ultra Mild	3.0/0.3
9.	Vista	12.0/1.2
10.	Matinee Extra Mild	4.0/0.4
11.	Viscount	5.0/0.4
12.	Viscount No.1 Ultra Light	0.7/0.07
*	No delivery information available at time of test.	

The cigarettes were smoked in standard fashion by the panel with order of presentation randomised between panellists. Six cigarettes were smoked at the first session and six at the second, one day later. The results were analyzed by the INGRID program to yield measures of the overall similarity between products (inter-cigarette correlations), the relationships between the assessment parameters (inter-parameter correlations) and the relative profiles of each of the cigarettes (cigarette by parameter correlations).

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Results: Figure 1 is a representation of the data in two-dimensional space, following the principal components analysis of the mean scores by INGRID. It can be seen that very little discrimination between products has been achieved, beyond a general tracking of "strength". Inspection of the analysis revealed that more than 95% of the total variance is accounted for by the first component. Only for the higher delivery cigarettes (nos. 1, 2, 3, 4 and 9) is there any evidence of dispersion on the second component. Furthermore, the correlations between the assessment parameters was unusually high ($> \pm .90$), suggesting that the "bandwidth" of the products being evaluated was too wide. It was therefore decided to re-evaluate a sub-set of the original sample supplied, concentrating on those products with a tar delivery of 5mg. or less. Accordingly, a second evaluation was made using the following cigarettes. Note (1) that the code numbers have been changed and (2) that a further cigarette (John Player Ultra Mild K.S., ex-U.K) has been added to the ensemble. This has no particular significance but was included in order to bring the number of products to the usual minimum required by the method.

<u>No.</u>	<u>Brand</u>	<u>Tar/Nic</u> <u>(mg.)</u>
1.	John Player Ultra Mild K.S.	
2.	Accord Ultra Mild	3.0/0.3
3.	Craven A Special Mild	4.0/0.4
4.	Medallion Ultra Mild	1.0/0.1
5.	Viscount No.1 Ultra Light	0.7/0.07
6.	Craven A Ultra Light	1.0/0.1
7.	Matinee Extra Mild	4.0/0.4
8.	Viscount	5.0/0.4

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Results: Figure 2 shows the disposition of the products and parameters in respect of the first two principal components. On this occasion 90% of the variance is accounted for by the first principal component and nearly 6% relates to the second. It can be seen from Figure 2 that a greater dispersion between parameters and products has indeed been achieved now that attention has been focussed on this lower delivery sub-set.

It should be remembered that the plot is an estimate of the "best fit" for the data and should not be relied upon for detailed interpretation. Nevertheless it can be seen that cigarette 5 (Viscount No.1 Ultra Light) adopts its expected position to the left of the plot. (Our convention is to label the "high" end of each assessment parameter). The two one mg. products 6. (Craven A Ultra Light) and 4. (Medallion Ultra Mild) are both found in appropriate relationship with Viscount No.1, with the ITL product apparently giving a slightly better account of itself than the Craven cigarette.

Cigarette 3 (Craven A Special Mild) is somewhat distant from the other 4mg. product, No.7 (Matinee Extra Mild). The position of cigarette 8 (Viscount) is influenced by its apparently dominant mouthfeel impression whilst cigarette 2 (Accord Ultra Mild) achieves a position which belies its relatively modest delivery levels.

More detailed appreciations of each cigarette's performance can be obtained by reference to the tabular information. First, consider the overall similarities between the products (Table 1).

It can be seen that, overall, and disregarding the U.K. product, the two most similar products are Accord Ultra Mild and Matinee Extra Mild ($r = .93$) and Viscount No.1 Ultra Light and Craven A Ultra Light ($r = .93$). Not suprisingly Medallion Ultra Mild was perceived as being overall most similar to Viscount No.1 Ultra Light ($r = .76$) and Craven A Ultra Light ($r = .73$);

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otherwise it is dissimilar to all the other Canadian products evaluated.

The relative profiles of each of the products can be inferred from Table 2 which shows the correlations between products and parameters. It should be noted that the values of the correlations in this example are atypically high, reflecting the high loading on the first principal component.

The cigarettes achieving the highest ACCEPTABILITY are Accord Ultra Mild and Matinee Extra Mild ($r = .93$). Their profiles are remarkably similar with the Matinee cigarette achieving slightly better mechanics (MOUTHFULL and DRAW EFFORT) and giving a higher irritation, particularly in the mouth (MOUTHFEEL). Accord does better in terms of IMPACT. It is our view that high ACCEPTABILITY can be achieved in a variety of ways; given a minimum standard on mechanics, irritation/impact, and taste it is probably the balance between these components which determines the overall ACCEPTABILITY. Within limits, we would suggest, it is possible to trade poor performance on one aspect for better performance on another. In this way, perhaps, Accord is able to achieve parity with Matinee Extra Mild in terms of ACCEPTABILITY despite somewhat different relative profiles.

The least ACCEPTABLE Canadian cigarettes were Craven A Ultra Light ($r = -.91$), Medallion Ultra Mild ($r = -.90$) and Viscount No.1 Ultra Light ($r = -.89$). Inspection of the profiles would suggest that Medallion Ultra Mild is a "better" product than its ACCEPTABILITY rating would suggest since it performs better than the other two on all other parameters. This anomaly is probably a reflection of the expectations of this particular (U.K) panel.

Both Matinee Extra Mild and Viscount display good mechanics but the ITL product provides higher impressions of irritation in the nose (NOSEFEEL) and throat (THROATFEEL), has a higher IMPACT, and gives greater impressions of both TASTE and AROMA.

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Cigarette 3 (Craven A Special Mild) presents a "middle-of-the-road" profile perfectly consistent with its location in Figure 2.

Finally, inspection of Table 3 shows the interrelationships between the assessment parameters. It should be noted that there is an unusual polarity of association between the parameters which is not usually found in these evaluations. It is to be recalled that (1) the range of differences between these products is quite small, and (2) for this "bandwidth" of deliveries, the parameters are probably highly intercorrelated in an objective sense anyway.

It is usually instructive, although less so in the present case, to inspect the correlations with ACCEPTABILITY in order to determine the parameters most influential in achieving ACCEPTABILITY. Although the differences in the present case are small, it appears that a low DRAW EFFORT ($r = .96$) and a high level of TASTE ($r = .94$) are particularly important in determining ACCEPTABILITY for these specific cigarettes on this occasion for the GR&DC panel. It should be emphasised that determinations of ACCEPTABILITY are undertaken for purely intrinsic reasons, as demonstrated here, and as yet have no predictive value in relation to market acceptability or consumer response.

Finally, one cannot fail to observe that all the Canadian products entering this evaluation fared better on almost all parameters than the U.K. John Player Ultra Mild K.S. which was perceived by this panel to be the least acceptable cigarette.

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FIGURE 1

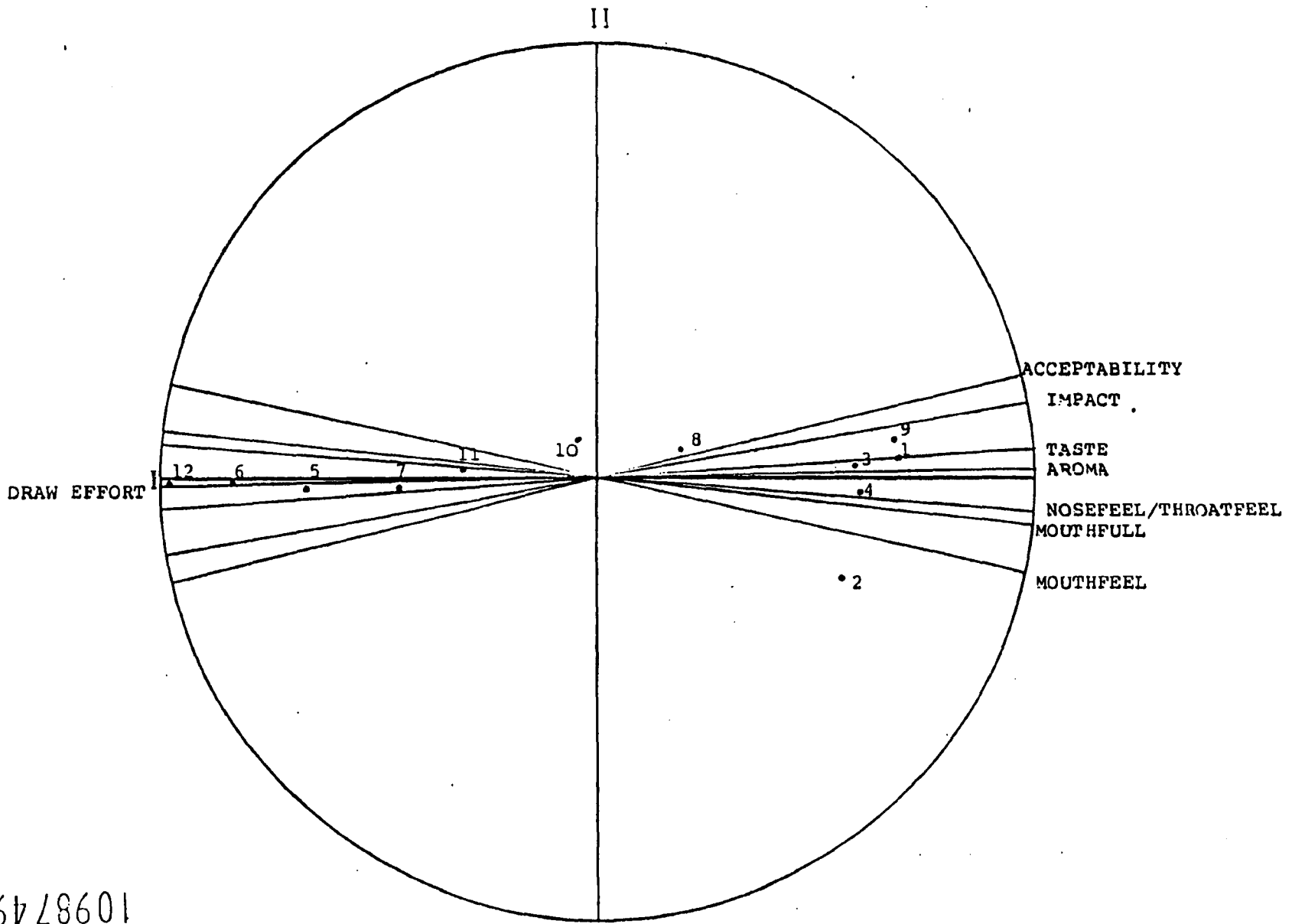
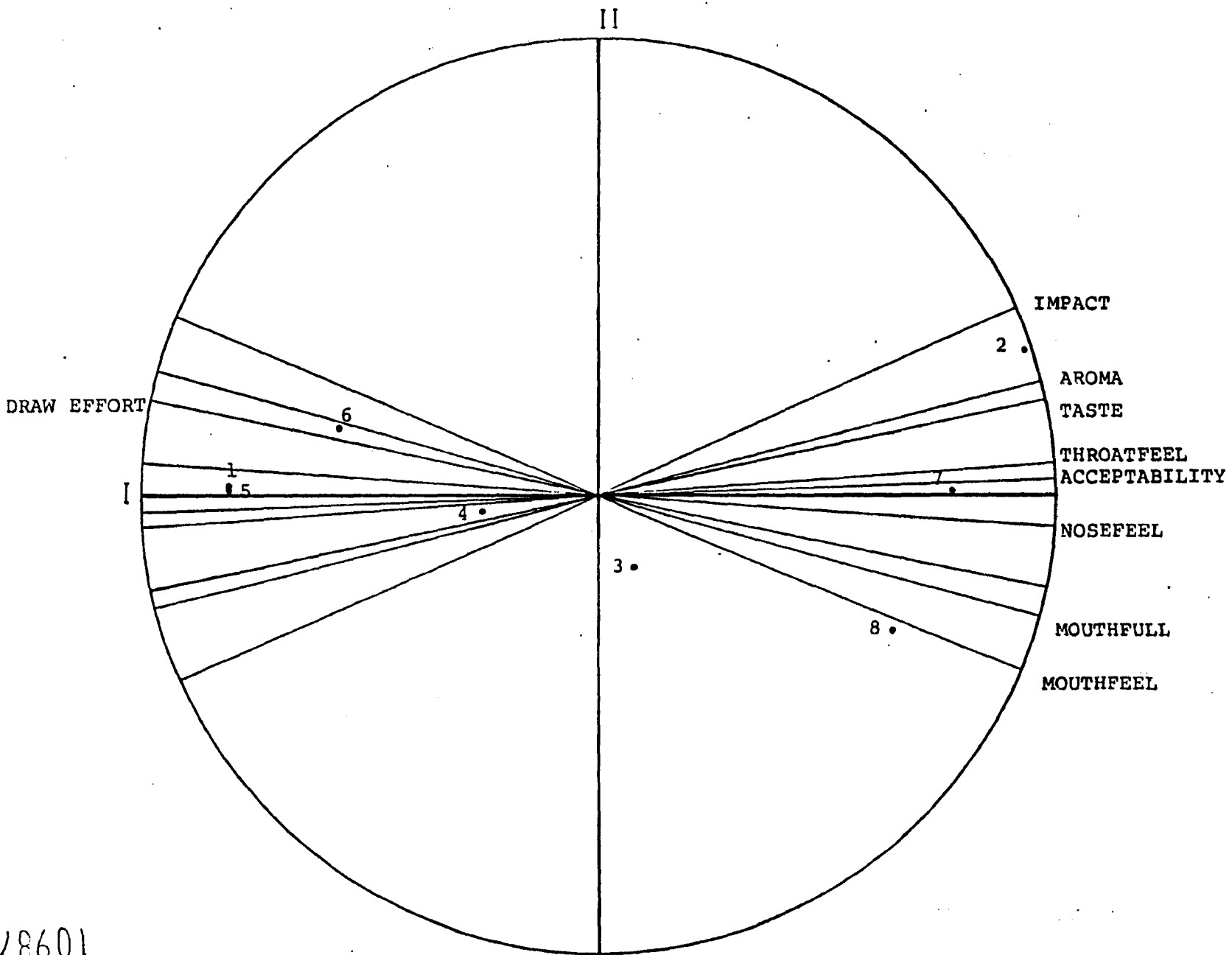


FIGURE 2



TAB 1 - INTER-CIGARETTE CORRELATIONS

	2 ACCORD ULTRA MILD	3 CRAVEN 'A' SPECIAL MILD	4 MEDALLION ULTRA MILD	5 VISCOUNT NO.1 ULTRA LIGHT	6 CRAVEN 'A' ULTRA LIGHT	7 MATINÉE EXTRA MILD	8 VISCOUNT
1 JOHN PLAYER ULTRA MILD K.S. (U.K)	-.93	-.24	.77	.95	.94	-.99	-.90
2 ACCORD ULTRA MILD		.90	-.83	-.92	-.83	.93	.72
3 CRAVEN 'A' SPECIAL MILD			-.90	-.43	-.49	.31	.39
4 MEDALLION ULTRA MILD				.76	.73	-.78	-.75
5 VISCOUNT NO.1 ULTRA LIGHT					.93	-.97	-.84
6 CRAVEN 'A' ULTRA LIGHT						-.94	-.93
7 MATINÉE EXTRA MILD							.86

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TABLE 2 - CORRELATIONS BETWEEN CIGARETTES AND ASSESSMENT PARAMETERS

	JOHN PLAYER ULTRA MILD K.S. (U.K.) 1	ACCORD ULTRA MILD 2	CRAVEN 'A' SPECIAL MILD 3	MEDALLION ULTRA MILD 4	VISCOUNT NO.1 ULTRA LIGHT 5	CRAVEN 'A' ULTRA LIGHT 6	MATINÉE EXTRA MILD 7	VISCOUNT 8
MOUTHFULL	-.95	.82	.46	-.76	-.95	-.96	.94	.96
DRAW EFFORT	.96	-.84	-.27	.82	.90	.94	-.93	-.98
MOUTHFEEL	-.89	.72	.62	-.60	-.90	-.98	.90	.91
NOSEFEEL	-.97	.91	.43	-.80	-.99	-.96	.99	.88
THROATFEEL	-.96	.95	.36	-.75	-.99	-.94	.98	.82
IMPACT	-.85	.98	.16	-.78	-.90	-.78	.89	.60
TASTE	-.96	.98	.15	-.83	-.94	-.87	.98	.78
AROMA	-.96	.96	.02	-.71	-.89	-.83	.94	.75
ACCEPTABILITY	-.95	.93	.14	-.90	-.89	-.91	.93	.89

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TABLE 3 - INTER-ASSESSMENT PARAMETER CORRELATIONS

		2	3	4	5	6	7	8	9
		DRAW EFFORT	MOUTHFEEL	NOSEFEEL	THROATFEEL	IMPACT	TASTE	AROMA	ACCEPTABILITY
MOUTHFULL	1	-.96	.94	.97	.93	.75	.87	.82	.90
DRAW EFFORT	2		-.89	-.93	-.89	-.74	-.89	-.86	-.96
MOUTHFEEL	3			.92	.88	.67	.79	.75	.80
NOSEFEEL	4				.98	.88	.95	.89	.92
THROATFEEL	5					.93	.96	.93	.91
IMPACT	6						.94	.89	.85
TASTE	7							.97	.94
AROMA	8								.91

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