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Novometrics *vs.* ODA: Work Shift and Raw Material Production Quality

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Prior research[1] used ODA to identify the association between work shift (multicategorical class variable, dummy-coded as 1, 2, 3) and the quality of raw material produced (ordered attribute consisting of the integers 1-6). The model obtained using ODA is compared with a novometric model[2-6] obtained for the same data.

Data for this application are given in Table 1.

Table 1: Shift and Production Quality

	Work Shift		
Quality	1	2	3
1	11	17	6
2	23	29	21
3	8	10	8
4	5	17	24
5	18	7	15
6	18	15	9

The ODA model is: if quality≤ 3 predict shift=2; if quality=4 predict shift=3; if quality≥5 predict shift=1: relatively weak ESS=15.6, $p<0.0035$, D=16.2 (Table 2).

Table 2: Confusion Table for ODA Model

Actual	Predicted Shift			
Shift	1	2	3	Sensitivity
1	36	42	5	43.4
2	22	56	17	59.0
3	24	35	24	28.9

For these data the novometric (globally optimal or GO) model is: if quality≤4 predict shift>1; if quality>4 predict shift=1: relatively weak ESS=17.5, $p<0.019$, D=9.41 (Table 3). Compared to the novometric model, the ODA model is [(15.6/9.41)-1]x100%=65.8% further away from a theoretically optimal model.[2,6]

Table 3: Confusion Table for GO Model

Actual	Predicted Shift		
Shift	1	2,3	Sensitivity
1	36	47	43.4
2,3	46	132	74.2

References

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Author Notes

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