Components of Some New Zealand Attitudes to Alcohol and Drinking in 1978-79: A Preliminary Report

R.A.M. Gregson and B.G. Stacey
University of Canterbury

In 1978 the Alcoholic Advisory Council commissioned a national sample survey covering topics relating to alcohol and its consumption. Attitudes to alcohol and drinking were explored via 21 items in the interview. The distribution of responses to the 21 attitude items of the 10,000 survey sample members is presented. A principal components analysis of these items identifies structural relations within the set of items, which indicates the existence of at least 3 major attitudinal dimensions.

In 1978 the Alcoholic Liquor Advisory Council (ALAC) commissioned a nationwide survey of 10,000 persons, to investigate a diversity of topics relating to alcohol and its consumption in New Zealand. This survey was planned by an ALAC subcommittee chaired by the first author. The initial drafts of the interviewing schedule used were designed by that subcommittee. The fieldwork was conducted throughout by staff of the National Research Bureau (NRB), initially through two pilot phases involving successively 100 and then 1000 respondents: and after interviewing schedule and procedural revisions then on, in late 1978 and early 1979, to a national random stratified sample of 10,000 persons spread over rural and urban areas of varying population densities in the North and South Islands. The schedule included items (a) on attitudes to alcohol and drinking, reactions to which are the subject of this paper; (b) on self-reported consumption of alcohol, personal involvement in accidents and in intra-family situations involving alcohol, and the respondent's medical history; (c) on information about respondent characteristics such as age, sex, race, educational level, occupation, religion, but not disposable income. The age range of respondents in the sample was 14 to 65 years of age inclusive.

This survey is thus the largest and most complex investigation of its type and subject matter conducted within New Zealand. The same applies internationally in terms of the sample size, the sampling fraction of the national population surveyed (1 in 300), and the detailed multivariate approach to the analysis of the survey data. The

survey results constitute a baseline from which other studies may depart in assessing trends through time.

Following a review of nearly 800 contingency tables produced in the initial phase of the analysis and some additional frequency information (Gregson, Note 1), the authors obtained a grant from ALAC to proceed with a multivariate analysis and some further frequency analyses. In practice, this was made possible by the storage of the coded responses of all 10,000 respondents on magnetic tape as a data archive. As many requests for normative data on the attitude items have already reached us, we report here a principal components analysis of these items so that response distributions and factor information may be made available to researchers and other interested people. Inevitably, our final lengthy report will not be available for some time. The data archive is available to all researchers who apply to ALAC and obtain support for additional analyses.

The importance of the normative findings presented here rests on the fact that some highly significant relationships between attitudes and age, sex, occupation, religion, race, road accident involvement (Gregson & Hurst, 1980), and self-reported drinking levels have already been found in the early analyses. As the number of variables in this survey is large and the causal interdependencies complex, we refer readers to the series of preliminary papers given at the Nelson Symposium of May 1979 (available upon request from ALAC, Wellington) for what is so far established.

The 21 7-category attitude items (each running from "strongly agree" to "strongly disagree") are shown, with their percentage distributions of responses over 10,000 subjects, in Table 1. The abbreviation "a +" to "d +" run from strongly agree to strongly disagree. The 95% credibility

Table 1

Percentage distribution of responses from 10,000 sample members to 21 attitude items

	a +	a	a −	o	d −	d	d +
a. People in N.Z. consume more alcoholic drink nowadays than they used to	22.8	47.8	8.6	14.1	2.4	3.8	0.5
b. If people drink more in N.Z. then it is just part of the change that is going on in many other countries	3.6	40.5	15.0	21.1	5.3	13.6	1.1
c. We would have been better off if we had had prohibition in N.Z. 50 years ago	4.1	9.9	6.0	11.8	6.3	42.0	19.9
d. Nowadays liquor is quite cheap in N.Z.	2.0	13.3	7.2	16.5	9.5	40.0	11.5
e. The increasing violent crime rate in N.Z. is due to liquor being so easy to get	13.8	32.6	21.6	5.4	9.0	15.2	2.5
f. Advertising campaigns have helped to reduce the amount of drinking and driving on our roads	7.1	35.8	22.6	7.2	6.5	17.9	2.9
g. Sensible families teach their children to try drinking in moderation from an age earlier than 18	13.9	51.4	12.0	6.9	3.2	9.9	2.8
h. People drink in N.Z. because there is nothing else to do with their time	4.1	15.7	16.3	4.2	8.9	37.6	13.3
i. There would be fewer crimes involving alcohol if unemployment went down	6.9	31.4	17.0	11.8	7.2	22.8	2.9
j. Alcoholics cannot help being alcoholics. It's not their fault	6.2	24.4	12.4	10.0	10.5	27.4	9.1
k. It is sportsmen who set a bad example by drinking too much	4.1	15.2	14.1	7.5	10.9	40.0	8.2
l. We would have fewer problems with heavy drinkers if we had more sensible laws about drinking	9.9	35.3	14.0	10.3	7.7	20.7	2.0
m. New Zealanders have a reputation overseas for being heavy drinkers	5.3	30.4	10.5	36.7	4.4	11.3	1.6
n. We should stop bothering about the amount of drinking in N.Z.	1.9	8.6	6.3	4.5	10.9	47.9	20.0
o. Most young people under 18 are already drinking more than is good for them	14.7	46.3	14.7	9.8	5.8	7.8	0.9
p. Alcohol is a source of conflict in most families with teenage children	6.1	30.2	19.5	20.2	8.7	14.2	1.1
q. Despite the odd exception most young New Zealanders drink alcohol in a fairly sensible way	2.0	37.7	21.3	10.8	11.6	15.0	1.6
r. Alcohol is probably the single most important cause of breakdown in N.Z. marriages today	10.6	27.3	18.6	16.4	7.9	16.5	2.6
s. The only people who listen to warnings about alcohol and driving are those who don't drink and drive anyway	4.9	26.1	15.6	7.0	13.4	30.0	3.0
t. The normal healthy person likes to drink a little, but often	2.5	38.8	17.6	11.6	9.9	18.1	1.6
u. At present we worry too much about alcohol in comparison to the other serious problems facing the country	5.6	23.1	15.6	7.1	12.9	30.6	5.1

interval on a reported percentage can be estimated by Bayesian methods, using a Dirichlet prior distribution which explicitly recognizes the statistical non-independence of categories within items (Box & Tiao, 1973; Isaacs et al., 1976; Novick & Jackson, 1974); it is about ±0.5% in a single category. It is not legitimate to use binomial limits here due to the non-independence of the 7 categories in any given time.

The cumulative frequency distributions on each of the 21 items were separately treated as points on a cumulative Gaussian distribution, with each frequency being taken as the centroid of a segment of the normal distribution. The tail end distributions were treated as triangular areas bounded with zero density outside ± *3SDs*. This is in effect a conversion to item characteristic curves for each variable. The procedure yields new deviate values for each of the 7 x 21 categories which are given in Table 2. These values replace the original integers 1 through 7 which are not used in the analysis at any point. In a large sample this results asymptotically in the 21 items having zero means and unit variances. The correlation matrix thus approximates a covariance matrix.

The values in Table 2 were then employed as inputs to a modified IBMSSR Principal Components programme which would accept 10,000 cases. The unrotated and varimax rotated loadings, using an eigenvalue cut off point of 0.95, were obtained successively on samples of 100, 300, 500, 1000 and 10,000. This was done in order to examine the approximate point, in terms of sample size, at which stability in the loadings was achieved. This stability, to at least the first decimal point, emerged in the first two eigenvectors after a sample of 500 cases was taken. It was a salutary exercise to perform these successive exploratory analyses and see that

Table 2
*Values Resulting from Transformation of Attitude Item Frequency Distributions
to Cumulative Normal Form*

	Cumulative Normal Response Deviate Values						
a	-1.036	-0.108	0.671	1.089	1.598	1.977	2.652
b	-1.977	-0.713	0.040	0.513	0.946	1.433	2.457
c	-1.927	-1.335	-0.954	-0.648	-0.388	0.231	1.112
d	-2.226	-1.366	-0.881	-0.504	-0.159	0.482	1.419
e	-1.328	-0.521	0.182	0.545	0.769	1.282	2.120
f	-1.675	0.674	0.106	0.498	0.703	1.182	2.075
g	-1.323	-0.264	0.562	0.867	1.071	1.430	2.096
h	-1.927	-1.180	0.586	-0.300	-0.133	0.468	1.350
i	-1.685	-0.752	-0.080	0.285	0.545	1.067	2.075
j	-1.739	-0.900	-0.337	-0.050	0.208	0.745	1.546
k	-1.927	-1.190	0.634	0.329	0.091	0.577	1.598
l	-1.506	-0.597	0.055	0.369	0.623	1.152	2.170
m	-1.812	-0.824	-0.231	0.373	0.860	1.468	2.326
n	-2.257	-1.538	-1.096	-0.877	-0.622	0.154	1.108
o	-1.293	-0.310	0.478	0.863	1.195	1.665	2.457
p	-1.739	-0.799	-0.097	0.409	0.853	1.392	2.440
q	-2.226	-0.813	0.009	0.423	0.759	1.335	2.290
r	-1.468	-0.697	0.072	0.377	0.732	1.230	2.096
s	-1.840	-0.916	-0.284	0.002	0.261	0.915	2.034
t	-2.144	-0.776	0.002	0.377	0.687	1.254	2.326
u	-1.778	-0.948	-0.345	0.055	0.196	0.827	1.823

stability in loadings did not show itself until a much larger data sample was used than is often the case in attitudinal research in New Zealand.

The appropriate exploratory analysis here is a principal components, to establish the basis of a minimal set of regression equations to relate measures of alcohol consumption to attitudes (Gregson & Stacey, Note 2). The rationale for this choice is discussed and justified by Mulaik (1972, p. 174). The commonly quoted cut-off of 1.0 on eigenvalue is based on an error-free theoretical analysis due to Kaiser (1961). When using real data in a numerical algorithm which inverts matrices and solves matrix equations iteratively, there is some advantage in taking a marginally lower cut-off as a protection. Additionally, in this case there is no eigenvalue in the range 0.95 - 1.0 so the conventional practice was in fact fortuitously followed.

The unrotated and rotated (varimax) loadings of 7 principal components are given in Table 3. It will be noted that rotation has a relatively minor effect on the pattern of loadings, particularly on the first 2 components, which is to say the rotation is small to varimax; therefore only the loadings after rotation will be discussed heuristically. The scoring convention of the items implies that a positive component loading goes with disagreement, and vice versa.

The first component (unrotated variance 15.8%) is associated with items a, e, m, o, p, r and s. This could be interpreted as a lack of concern with the existence of alcohol-related problems in contemporary New Zealand society, particularly in relation to the young. The second component (unrotated variance 8.3%) is associated with items

n, q, t and u. This could be interpreted as concern with alcohol and alcohol-related problems.

The third component (6.14%) is saturated largely with item f. This component implies acceptance of the efficacy of advertising directed at drinking and driving, together with encouragement of moderate drinking among the young. That this factor emerged after the two major components may mean that agreement with propaganda urging moderation with alcohol can exist independently of dominant attitudes. As yet we do not know how various attitudes are linked to reported drinking behaviour, though the minority of very heavy drinkers tend strongly to endorse item u.

The fourth component (5.4%) is associated with items c, g, j and m. It seems positively to reflect the temperance/prohibition tradition. It is also possible that any yea-saying behaviour among the elderly may surface in this component. The remaining components should be treated with considerable reserve unless and until they can be shown to be discriminative between groups, or amenable to change over time, or related to actual consumption patterns, or replicated in future studies. They may possibly prove to be merely trivial components.

In this principal components analysis, the authors are not seeking an approximation to a common-factor structuring of the attitudes. The analysis summarizes the attitudinal information in a small number of variables that will be used in subsequent analyses. Of particular importance will be complex analyses involving the distribution of self-reported alcohol consumption in New Zealand.

NOTES AND COMMENT

Table 3
Principle Components for 21 Attitudes Items

Item	Component Loadings						
	1	2	3	4	5	6	7
a	43	-19	02	-01	-52	00	04
	48	-06	-19	-19	-38	-20	-06
b	02	0F	02	-01	-83	01	-05
	14	20	-22	-15	-68	-09	-10
c	27	-10	-07	-58	-10	20	-26
	50	-03	11	-15	-10	38	-11
d	02	-05	-12	-03	00	88	07
	16	-10	-18	29	-26	61	46
e	51	-24	-10	-12	-23	12	-15
	61	-05	11	15	-09	04	00
f	00	-03	-77	02	03	08	-12
	00	16	-35	-47	23	43	08
g	-02	10	-32	64	02	-03	03
	-20	24	-57	-03	19	-15	19
h	08	06	15	00	00	07	-63
	31	29	00	31	16	14	-34
i	13	07	-22	-02	-10	-16	-64
	31	39	-11	-09	23	14	-42
j	-18	-04	21	53	-21	18	-26
	-06	13	-47	47	-11	-08	-16
k	21	-14	26	08	-05	34	-38
	43	02	-10	44	-03	12	-07
l	26	03	-19	-02	08	00	-46
	36	27	-06	-03	28	16	-13
m	41	-16	11	35	11	11	-16
	39	00	-26	24	20	-18	15
n	-19	69	13	-06	05	-03	-07
	-31	56	33	14	-08	00	03
o	68	-09	03	-02	-04	-07	-08
	62	04	02	-13	08	-25	13
p	70	00	00	-04	00	-04	-12
	63	12	05	-11	11	-21	16
q	-28	39	-32	14	-26	04	10
	-38	38	-20	-19	-24	13	05
r	64	00	-01	-13	-07	10	-14
	64	13	07	-09	00	-05	16
s	46	22	27	-17	00	27	-12
	47	20	27	22	-14	00	21
t	26	59	-12	22	-05	02	05
	01	58	-02	-06	-06	-16	33
u	-11	72	-01	-03	03	-07	-09
	-26	64	26	02	-03	00	06

For each item, first line rotated loadings; second line unrotated loadings.

The associations among the attitude items are presented in Table 4 as additional information, and to allow interested readers to carry out further analyses of their own on the data in this paper. Given the very large and heterogeneous nature of the national sample even relatively weak associations are of potential interest.

The authors would welcome the utilization of some or all of these items by other researchers in further studies and in the exploration of their relationships with other attitudes and behaviours, e.g. with reference to smoking. The views expressed here are solely the authors' own, and do not represent ALAC statements or policy.

Reference Notes

1. Gregson, R. A. M. Alcohol, attitudes and self-reported consumption in New Zealand, 1978-1979. Presented at the ALAC Alcohol Research Conference, Nelson, 1979.

2. Gregson, R. A. M., & Stacey, B. G. The distribution of self-reported alcohol consumption in New Zealand, 1978-1979. In preparation.

Table 4

Correlation (Approximating Covariance) Matrix

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u
a	1.00																				
b	17	1.00																			
c	18	05	1.00																		
d	05	03	09	1.00																	
e	27	09	26	09	1.00																
f	00	01	02	02	02	1.00															
g	-05	00	-20	-02	-07	09	1.00														
h	07	04	12	04	11	00	00	1.00													
i	06	06	12	-02	16	07	03	16	1.00												
j	00	04	-11	04	-03	00	09	03	03	1.00											
k	12	06	14	10	20	-03	-05	13	11	06	1.00										
l	10	02	16	02	15	04	01	13	18	00	12	1.00									
m	15	01	07	06	16	00	01	11	09	04	17	13	1.00								
n	-17	02	-08	-07	-20	00	02	02	00	03	-08	-04	-10	1.00							
o	27	06	20	03	31	00	-07	12	14	-05	18	18	19	-13	1.00						
p	20	06	21	03	28	02	-08	15	18	-03	17	16	19	-10	42	1.00					
q	-10	07	-15	-03	-13	08	16	-07	00	05	-14	-05	-12	19	-22	-18	1.00				
r	23	06	25	05	33	03	-10	15	16	-04	20	17	18	-10	30	40	-13	1.00			
s	13	05	22	07	20	-08	-10	15	10	-03	18	14	12	00	21	23	-11	29	1.00		
t	00	07	-04	-02	00	04	10	06	10	03	00	08	00	16	02	06	11	07	09	1.00	
u	-12	02	-08	-07	-17	02	06	04	07	00	-09	02	-10	38	-08	-08	20	-09	00	20	1.00

References

Box, G. E. P., & Tiao, G. C. *Bayesian inference in statistical analyses.* Reading: Mass.: Addison Wesley, 1973.

Gregson, R. A. M., & Hurst, P. M. Alchohol, attitudes and self-reported consumption in New Zealand, 1978-1979. *Proceedings of the 1st Pan-Pacific Conference on Drugs and Alcohol,* 1980, in press.

Isaacs, G. L., de Keyrel, D. F., & Novick, M. R. *Computer assisted data analysis* (CADA). University of Iowa, 1976.

Kaiser, H. F. A note on Guttman's lower bound for the number of common factors. *British Journal of Statistical Psychology,* 1961, *14,* 1-2.

Mulaik, S. A. *The foundations of factor analysis.* New York: McGraw Hill, 1972.

Novick, M. R., & Jackson, P. H. *Statistical methods for educational and psychological research.* New York: McGraw Hill, 1974.