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Attitude measurement and behaviour prediction III: analysis of data

T.R. Taylor

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This report forms part of project 3506.8, Attitude Assessment and Behaviour Prediction, undertaken in the Test Construction Division. It is one of a set of three reports which describe the major research performed under project 3506.8. Page numbering in the three reports is consecutive.

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SUMMARY

This is the third and final report of a set of three reports which describe the major research undertaken under project 3506.8.

In this report the analysis results are presented and discussed. Data were collected on two samples: one from the private sector and one from the public sector. The analyses performed can be classed into four categories:

* Basic analyses aimed at investigating the metric properties of the scales;

* Discriminant analyses investigating the predictive powers of attitudinal, cognitive and social pressure predictors of behaviour;

* Investigation of a second-order structure based on the affective-cognitive-conative conceptualization of attitude (or "disposition", as it is called in this study);

* Investigation of the Fishbein-Ajzen behaviour prediction model and a new behaviour prediction model which incorporates the dispositional structure.

Shortcomings of the models in accounting for certain phenomena are examined and discussed.

SAMEVATTING

Hierdie is die derde en finale verslag uit 'n reeks van drie verslae wat die hoofnavorsing, onderneem as deel van projek 3506.8, beskryf.

In hierdie verslag word die resultate van die ontledings uiteengesit en bespreek. Data aangaande twee steekproewe is ingesamel: een uit die privaatsektor en een uit die openbare sektor. Die ontledings wat uitgevoer is kan in view kategorieë ingedeel word:

* Basiese ontledings wat daarop gerig is om die metriese eienskappe van die skale te bapaal;

* Diskriminantanalises wat die voorspellingsvermoë van houdings, kognitiewe en sosiale-druk gedragsvoorspellers ondersoek;

* Ondersoek van 'n tweede-orde struktuur gebaseer op die affektiewe-kognitiewe-konatiewe konseptualisering van houding (of "disposisie" soos dit in hierdie studie genoem word);

* Ondersoek van die Fishbein-Ajzen gedragsvoorspellingsmodel en 'n nuwe gedragsvoorspellingsmodel wat die disposisionele struktuur inlyf;

Terkortkominge van die modelle se verklaring van sekere verskynsels word ondersoek en bespreek.

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9.0 BLACK ADVANCEMENT DATA ANALYSIS I: BASIC STATISTICS AND PRELIMINARY ANALYSIS

The Black advancement questionnaire was used to collect data in two samples. These two, one from the Private Sector and one from the Public Sector, will be referred to as the Priv and Pub samples respectively.

Almost all analyses were duplicated on the two samples. Priv and Pub sample results of a given analysis will be presented either together or in consecutive tables.

9.1 Scale Characteristics

Table 6 presents the following statistics on the scales: minimum and maximum possible scores, means and standard deviations.

In Table 7 we present the remainder of the important descriptive scale statistics: skewness, kurtosis and coefficient alpha reliability estimates. Note that in the kurtosis index used, a neutral kurtosis is zero, not 3. The reliability estimates, which have been taken from the IRE programme, are of the Alpha (2) type: missing information has been estimated on the basis of available data.

It should be borne in mind that all the scales used in this study were short: four items at the longest. The scales were short in order to keep the overall length of the questionnaire within manageable proportions and ensure that respondents did not become fatigued while answering the questionnaire. Considering their brevity, most scales performed in a creditable fashion. Inspection of the distributions reveals that most scale scores are reasonably normally distributed with acceptable levels of spread. Exceptions are the SDE, SDI and SDR scale scores on the Priv sample and the certainty scale scores TCE, TCI and TCR on the Pub sample, which are quite markedly skewed.

All Black advancement items were keyed in such a way that responses indicating positive reactions were given high scores. Hence, a high PCE score indicates that the respondent felt that his coworkers had a positive attitude to equality for Blacks at work; similarly a high CR score indicates that the respondent felt that placing Blacks in responsible positions would have positive consequences. The TCE, TCI and TCR scales were keyed such that a high score indicated high certainty (i.e., high intensity of attitudinal respohse). The WCC and WCM measures were keyed so that a high score indicated high willingness to comply.

TABLE 6

Maximum and Minimum Possible Scores, Means and Standard Deviations

Scale	Min Sc	Max Sc	Priv Mean	Pub Mean	Priv S.D.	Pub S.D.

sample appear to have misunderstood the task. L and T items are answered by endorsing one of five labelled alternatives. In order to answer SD items, on the other hand, the subject has to attain the concept of an abstract continuum which is arbitrarily divided into seven segments. Many respondents thought that they had to answer only one SD item despite the fact that instructions to the contrary were given. It seems then that the proneness of the SD task to misunderstanding is a fairly serious shortcoming of this method.

In most analyses performed on the Priv and Pub data, subjects who did not complete all questions were excluded. Only in analyses where missing information could be accommodated were incomplete protocols included.

In T items, the distribution of responses to the alternatives was platykurtic in most cases. In item TR2, for instance, which dealt with Blacks having a say in organizational policy, the following pattern of endorsement was obtained in the two samples.

	Very Much Against	Against	Neutral	In Favour	Very Much In Favour
Priv	0,12	0,12	0,27	0,32	0,17
Pub	0,18	0,26	0,21	0,30	0,05

The distribution of responses to SD alternatives also tended to be platykurtic, but somewhat skewed in the Priv Sample. The distributions for item SDI1 are given below.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
Priv	0,08	0,18	0,06	0,39	0,28
Pub	0,08	0,20	0,09	0,48	0,15

The L "uncertain" category might have attracted less endorsement than the T and SD neutral categories because "uncertain" has stronger connotations of indecisiveness than "neutral".

The SD scales had the highest internal consistency of the attitude measures. This is probably because items look similar to one another and tend to be rather transparent. It is therefore very easy for the subject to respond in a consistent fashion. L and T scales are somewhat less reliable than SD scales, possibly because of their more varied item content. Nevertheless the T and L reliabilities of between 0,6 and 0,9 are acceptable for four-item scales.

Almost all scales were more reliable in the Priv sample than in the Pub sample. The amount of scale variance in the two samples did not differ greatly, so it cannot be concluded that scales were more reliable in the Priv sample because of a greater divergence of response in this sample. It appears that Priv individuals were more consistent in their responses.

Inspection of the reliability indices of all scales indicates that most scales have satisfactory reliabilities. Exceptions are: WCC, WCM, PCR and CE in both samples and PMI, PCI and CR in the Pub sample. WCC and WCM are the shortest scales in the questionnaire with only two items; and PM and PC scales have only three items. The C scales have four items each, which is the same number used in the more reliable SD, T and L attitude scales. It seems likely that the cognitive domain cannot be measured as reliably as the affective because cognitions are less integrated than affective and conative responses. The affective response appears to be "simpler" and more global than the cognitive one which has to take greater account of the complexities of a given domain. Dissonance is a concept which is more appropriate to the cognitive field than the affective.

The Priv sample responded more positively than the Pub sample on all affective (T, L, SD), cognitive (C), pressure (PM, PC) and conative (BI) and behavioural (B) variables. In most cases, the scale means of the Priv respondents are higher than those of the Pub respondents by a margin of 10 to 15 percent of the total range of the scales. T scales have their "zero point" (point of indifference) at 12 (the neutral alternative of each of the 4 scale items is keyed as 3). The means of the Priv sample on the T scales are all slightly above the point of indifference, with the mean on the TE scale being the highest at 14,25. In the Pub sample, the mean on the TE scale is marginally above the point of indifference, whereas the means on the TI and TR scales are marginally below the point of indifference. In both samples, therefore, the concept of equality of opportunity was viewed more positively than integration and responsibility for Blacks. In the Pub sample, there were slightly more negative responses to integration and responsibility issues than positive ones.

Behavioural scales consisted of two items, the first involving giving one's name to the NIPR as a supporter or opponent of various Black advancement issues and the second involving authorizing the release of one's name to one's employer as a supporter or opponent of these issues. Each item allowed the subject three alternatives: to identify himself as a supporter or opponent of the issue in question, or to remain anonymous. Table 8 presents the percentages of respondents falling into each category.

In all three subdomains, more Priv respondents identified themselves than Pub respondents. The fact that large numbers of individuals in both samples chose to remain anonymous indicates that the name-giving activity was not taken lightly. It seems justifiable to say that the behavioural measure used in this study is freer of the influences of falsification than self-report behavioural measures. Fewer people in both samples identified themselves to their organization than to the NIPR. In all but two cases, the proportions of both positive and negative identifications shrank in the second item. This is not surprising, as giving one's name to one's employer as a supporter or opponent of a Black advancement issue is a more decisive action than giving one's name confidentially to the NIPR.

TABLE 8

Percentages of Individuals in Three Behavioural Categories

	Giving Name As Supporter			Remaining Anonymous			Giving Name As Opponent		
	E	I	R	E	I	R	E	I	R
TO NIPR									
Priv Sample	49,3	49,5	44,4	44,4	45,6	46,3	6,3	4,9	9,3
Pub Sample	25,3	28,7	24,1	59,2	56,3	56,3	15,5	14,9	19,5
TO EMPLOYER									
Priv Sample	46,3	42,0	38,5	50,7	53,2	56,1	2,9	4,9	5,4
Pub Sample	17,2	11,5	14,4	70,7	69,5	72,4	12,1	19,0	13,2

Forty to 50 percent of Priv respondents identified themselves as supporters of E, I and R issues; many fewer Pub individuals were prepared to do this. On the other hand, a not insignificant number of Pub respondents were prepared to identify themselves as opponents of the issues, whereas only three to nine percent of Priv respondents were prepared to do so. These differences are probably due to two factors: more conservative attitudes in the Pub sample and less managerial pressure towards positive attitudes and behaviour in this sample.

The Priv and Pub matrices of intercorrelations of all variables are to be found in Appendices I and II respectively. The programme used to calculate the intercorrelations can accommodate missing information. Hence it was not necessary to use only absolutely complete protocols. The number of people included in the calculation of correlation r_{ij} is $N_i \cap N_j$, where N_i is the set of people who completed scale i and N_j is the set who completed scale j. In the P sample, Ns vary from 171 to 216 and in the Pub sample from 154 to 174. Only those correlations involving SD scales have Ns substantially belo maximum sample size.

Certain exerpts from the matrices appearing in Appendices I and II wil presented in this chapter in order to illustrate some of the more noteworthy aspects of the interrelationships between variables in the samples.

The three Black advancement attitudinal subdomains appear to be highly intercorrelated with one another. Later we shall examine the relationships between the latent attitudinal factors, but at present we shall look at the intercorrelations among the fallible manifest variables. Table 9 presents a (3x3) (three trait, three methods) MTMM correlation matrix of attitude scores based on the Priv data. A similar matrix of intercorrelations for the Pub sample is presented in Table 10.

TABLE 9

MTMM Matrix of Attitude Intercorrelations: Priv Sample

	TE	TI	TR	LE	LI	LR	SDE	SDI	SDR
TE	1,00								
TI	0,78	1,00							
TR	0,78	0,77	1,00						
LE	0,72	0,63	0,67	1,00					
LI	0,75	0,85	0,74	0,65	1,00				
LR	0,75	0,74	0,83	0,72	0,76	1,00			
SDE	0,70	0,75	0,71	0,62	0,76	0,69	1,00		
SDI	0,65	0,77	0,74	0,57	0,79	0,71	0,80	1,00	
SDR	0,71	0,73	0,82	0,64	0,73	0,80	0,85	0,81	1,00

TABLE 10

MTMM Matrix of intercorrelations: Pub Sample

	TE	TI	TR	LE	LI	LR	SDE	SDI	SDR
TE	1,00								
TI	0,66	1,00							
TR	0,71	0,70	1,00						
LE	0,76	0,59	0,64	1,00					
LI	0,68	0,75	0,73	0,67	1,00				
LR	0,69	0,68	0,80	0,67	0,79	1,00			
SDE	0,72	0,63	0,67	0,63	0,70	0,59	1,00		
SDI	0,67	0,71	0,68	0,64	0,77	0,68	0,72	1,00	
SDR	0,67	0,67	0,81	0,62	0,73	0,77	0,73	0,77	1,00

Overall, correlations tend to be higher in the Priv sample. Monomethod-heterotrait correlations are mostly in the 0,75-0,8 range in this example. Heteromethod-monotrait correlations are mostly in the low and mid 0,70s for the E subdomain and in the high 0,70s and low 0,80s for the I and R subdomains. Heteromethod-heterotrait correlations are mostly in the mid

0,60s to mid 0,70s range. As the subdomains are highly related to one another in this data the range of correlation magnitudes is small. The large number of high heteromethod-monotrait correlations suggests that convergent validity may be demonstrated, but inspection of comparable monomethod-heterotrait and heteromethod-heterotrait correlations suggests a significant method contribution to manifest scores. The correlation between TE and TI, for instance, is 0,78, whereas the correlation between TE and LI is 0,75, that between TE and SDI 0,65: heteromethod correlations are smaller than corresponding monomethod correlations.

The slightly smaller magnitude of correlations in the Pub matrix is probably due at least in part to the lower reliabilities of scale in the Pub sample. (One of the advantages of the confirmatory techniques which were applied to the Priv and Pub data is that the unreliabilities of measures can be taken into account.) In the Pub sample, heterotrait-monomethod correlations are mostly in the mid 0,60s to mid 0,70s range, with the SD method having the highest intercorrelations. Heteromethod-monotrait correlations are predominantly in the mid and upper 0,70s, with a few reaching the 0,80s. Heteromethod-heterotrait correlations are mostly in the high 0,50s to mid 0,60s range. Hence, the pattern of intercorrelations in the Pub sample is quite similar to that in the Priv sample, with the exception that the order of the correlations is somewhat lower.

In this study we have identified five variables which are considered important in the prediction of behaviour: affect, cognition, conation, coworker pressure and managerial pressure. Table 11 lists the correlations of these variables with the behavioural criterion for the three subdomains.

Examination of Table 11 reveals that corresponding affect-behaviour correlations in the Priv and Pub samples are for the most part of much the same order. Fisher (1941) provides a method for converting correlation coefficients into Z-scores, thus making it possible to test whether two sample values of r are drawn at random from the same population. The transformation:

$$Z = [\ln(1 + r) - \ln(1 - r)]$$

is distributed approximately normally with standard error:

$$\frac{1}{\sqrt{n - 3}}$$

where

n is the size of the sample.

TABLE 11

Correlations of Affective, Cognitive, Conative and Pressure Variables with Behaviour

Variables Correlated	Priv Sample	Pub Sample
TExBE	0,61	0,61
TIxBI	0,66	0,55
TRxBR	0,68	0,57
LExBE	0,56	0,61
LIxBI	0,64	0,58
LRxBR	0,61	0,55
SDExBE	0,60	0,59
SDIxBI	0,62	0,63
SDRxBR	0,63	0,54
CExBE	0,45	0,48
CIxBI	0,61	0,55
CRxBR	0,57	0,41
BIExBE	0,66	0,65
BIIxBI	0,70	0,62
BIRxBR	0,73	0,53
PMExBE	0,43	0,36
PMIxBI	0,55	0,40
PMRxBR	0,47	0,35
PCExBE	0,51	0,40
PCIxBI	0,58	0,41
PCRxBR	0,42	0,40

In order to test the significance of the difference between two correlations r_1 and r_2 which are based on different samples, the significance of Z_D must be tested. This statistic is expressed:

$$Z_D = \frac{[\ln(1 + r_1) - \ln(1 - r_1)] - [\ln(1 + r_2) - \ln(1 - r_2)]}{2\sqrt{\frac{1}{n_1 - 3} + \frac{1}{n_2 - 3}}}$$

where

n_1 is the size of the population on which r_1 is based, and
n_2 is the size of the population on which r_2 is based.

Correlations which differ significantly between the two samples are the following: CRxBR (n_1=212, n_2=171, Z_D=2,05); BIRxBR (n_1=212, n_2=172, Z_D=3,27); PCIxBI (n_1=215, n_2=174, Z_D=2,20).

When data collection took place, Black advancement programmes had been introduced to a much greater extent in the Priv sample than the Pub sample. Numbers of Blacks were in senior positions in the Priv company. It is possibly for this reason that the BIR-BR correlation is stronger in the Priv sample: for Priv individuals, the R issue was less hypothetical than for their Pub counterparts and this might have led to greater consistency between conation and behaviour in Priv testees. Similar arguments can be put forward in support of the higher CR-BR and PCI-BI correlations in the Priv group.

Within each sample, the corresponding affect-behaviour correlations among methods do not differ greatly. Not surprisingly, behavioural intention (conation) x behaviour correlations are substantial, but not appreciably more so than affect x behaviour correlations. Cognition x behaviour correlations seem to be somewhat weaker. Pressure x behaviour correlations also appear to be lower than the affect x behaviour and conation x behaviour relationships, especially in the Pub sample. It must be borne in mind, however, that the cognitive and pressure variables have lower reliabilities than other measures. This might limit the magnitude of the correlations of these variables with behaviour.

All affective, cognitive, conative and pressure variables correlate significantly with behaviour in both samples ($p<0,001$ in all cases). Hence Hypothesis 1 is confirmed.

Tables 12, 13 and 14 present the Priv intercorrelations between T, L, SD, C, BI, PC and PM predictor variables in the E, I, and R subdomains respectively. Tables 15, 16 and 17 present comparable sets of intercorrelations for the Pub sample.

TABLE 12

Intercorrelations Among E Predictor Variables: Priv Sample

	TE	LE	SDE	CE	BIE	PCE	PME
TE	1,00						
LE	0,72	1,00					
SDE	0,70	0,62	1,00				
CE	0,62	0,51	0,58	1,00			
BIE	0,68	0,64	0,72	0,58	1,00		
PCE	0,53	0,52	0,53	0,53	0,63	1,00	
PME	0,46	0,48	0,43	0,46	0,52	0,57	1,00

TABLE 13

Intercorrelations Among I Predictor Variables: Priv Sample

	TI	LI	SDI	CI	BII	PCI	PMI
TI	1,00						
LI	0,85	1,00					
SDI	0,77	0,79	1,00				
CI	0,69	0,70	0,74	1,00			
BII	0,75	0,75	0,75	0,70	1,00		
PCI	0,65	0,65	0,64	0,61	0,66	1,00	
PMI	0,60	0,60	0,53	0,47	0,56	0,56	1,00

TABLE 14

Intercorrelations Among R Predictor Variables: Priv Sample

	TR	LR	SDR	CR	BIR	PCR	PMR
TR	1,00						
LR	0,83	1,00					
SDR	0,82	0,80	1,00				
CR	0,73	0,72	0,72	1,00			
BIR	0,81	0,77	0,80	0,75	1,00		
PCR	0,47	0,55	0,51	0,48	0,49	1,00	
PMR	0,41	0,49	0,39	0,37	0,52	0,33	1,00

TABLE 15

Intercorrelations Among E Predictor Variables: Pub Sample

	TE	LE	SDE	CE	BIE	PCE	PME
TE	1,00						
LE	0,76	1,00					
SDE	0,72	0,63	1,00				
CE	0,57	0,54	0,47	1,00			
BIE	0,76	0,71	0,68	0,61	1,00		
PCE	0,54	0,53	0,50	0,48	0,64	1,00	
PME	0,50	0,45	0,42	0,46	0,55	0,53	1,00

TABLE 16

Intercorrelations Among I Predictor Variables: Pub Sample

	TI	LI	SDI	CI	BII	PCI	PMI
TI	1,00						
LI	0,75	1,00					
SDI	0,71	0,77	1,00				
CI	0,65	0,77	0,70	1,00			
BII	0,71	0,71	0,70	0,60	1,00		
PCI	0,49	0,66	0,60	0,65	0,53	1,00	
PMI	0,40	0,48	0,50	0,52	0,43	0,56	1,00

TABLE 17

Intercorrelations Among R Predictor Variables: Pub Sample

	TR	LR	SDR	CR	BIR	PCR	PMR
TR	1,00						
LR	0,80	1,00					
SDR	0,81	0,77	1,00				
CR	0,67	0,71	0,68	1,00			
BIR	0,80	0,75	0,81	0,64	1,00		
PCR	0,64	0,55	0,56	0,52	0,59	1,00	
PMR	0,42	0,36	0,38	0,25	0,34	0,42	1,00

In all three subdomains and both groups, the following regularities can be seen. All affect and behavioural intention scales correlate highly with one another. Most of these intercorrelations are greater than 0,70. The cognitive scales correlate substantially with the affect and behavioural intention scales, but intercorrelations are weaker than those among affect and behavioural intention. The low reliabilities of the cognitive scales could be partly responsible for this. Pressure scales are only modestly correlated with the scales of affect, cognition and conation. The PM measures appear to be more modestly correlated with affective, conative and cognitive variables than PC measures. It is possible that coworker pressure had a greater impact on evaluations and behavioural tendencies than managerial pressure in the individuals studied.

The PC and PM constructs are only moderately correlated with each other. Hence, they may be seen as relatively independent sources of pressure on the individual.

Inspection of the full Priv and Pub correlation matrices given in Appendices I and II reveals that all variables except five have moderate-to-large, intercorrelations with one another. These five variables are: TCE, TCI, TCR, WCC and WCM. TCE, TCI and TCR are substantially correlated only with one another. In the Priv sample, these three variables are intercorrelated at approximately the 0,7 level, and in the Pub sample between 0,53 and 0,62. The low order of intercorrelation of the certainty variables with other variables is due to the fact that certainty scales are "folded over" relative to the other scales. A high certainty score is generally accompanied by an extreme affective response, but the certainty score does not reflect whether this response is positive or negative. Correlations with other variables which are bipolar therefore tend to be very small. The WCC and WCM scales are also related only to each other. In the Priv sample, the two scales are correlated 0,46, and in the Pub sample 0,67. It seems therefore that there is some evidence for a general willingness to comply tendency in the public sector sample, whereas in the private sector sample there is less evidence for this.

9.2 Elementary Manipulations Performed on the Data

Three sets of elementary manipulations were performed on the data. In the first, Taylor extremity (T) and intensity (TC) scores were combined multiplicatively and the resultant scales correlated with other variables. In the second, the samples were split into high willingness to comply and low willingness to comply individuals, and the magnitude of corresponding correlations compared in the two groups. Finally, individuals were divided into those who had high within-scale variability on the affect measures and those who had low variability on these measures: again, corresponding correlations were compared for the two groups. These three investigations will be described briefly below.

9.2.1 Multiplicative combination of T and TC scales

The data analyses described up to this point have not required any specific coding of the response alternatives of items. In T items, for instance, no fundamental change is brought about if the coding of the five response alternatives were transformed by adding any given constant k to all these values. The new point of indifference of T scale would change from 12 to 12+4k, and standard deviations and correlations with other variables would remain unchanged.

Once we multiply T scores by TC scores, however, we must be more careful in our coding. The neutral category must receive the value of zero, as we do not want the value of the neutral category to be changed by TC. In more concrete terms, a person who is fairly certain that he is neutral should receive the same score as one who is very certain that he is neutral. Other values of response alternatives should be influenced by the effects of TC.

In the coding for the T scales used up to this point, the integers 1 to 5 have been assigned to response alternatives; TC items have been coded 1 for fairly certain and 2 for very certain. We now perform the following transformation:

$$T' = \sum_{i=1}^{4} TC_i(T_i - 3)$$

where

- T' is the new measure,
- TC_i is the certainty of the extremity response to the i^{th} scale item, and
- T_i is the extremity score of the ith scale item.

Each item in T' can assume 7 values: -4, -2, -1, 0, 1, 2, 4. The T scale has been "stretched" by the multiplicative effect of TC. The scores -2 and 2 can be obtained in two ways: by endorsing an extreme alternative and being only fairly certain of it, or by endorsing a moderate (but nonzero) alternative and being very certain of it.

Postulate 1 predicts that T' scores will correlate more substantially with behaviour than T scores. It was expected that the TC scores would contribute valid extra predictive variance to the multiplicative T' index. The individuals most likely to actualize their attitudes in action (those individuals whose feelings are both extreme and intense) receive very high or very low scores on the T' scale.

Corresponding TxB and T'xB correlations for the E, I and R subdomains, based on the Pub data are as follows: TExBE: 0,61; T'ExBE: 0,61; TIxBI: 0,55; T'IxBI: 0,55; TRxBR: 0,57; T'RxBR: 0,55.

The predictive powers of the extremity and the extremity x intensity measures of affect are virtually the same. Hence, Postulate 1 receives no support. There are two possible reasons for the failure of T' to correlate more highly with B than T does. The first concerns the distribution of TC scores. These are highly negatively skewed: respondents endorsed the "very certain" alternative much more frequently than the "fairly certain" option. Hence, there is relatively little variance in the TC measures. The second possible reason for unspectacular performance of the T' variable is that the assignment of two different kinds of response to the values 2 and -2 re-ordered individuals in a way which adversely affected the attitude-behaviour correlation and cancelled out any beneficial effects created by "stretching" the extremes.

As the TC scores were also highly negatively skewed in the Priv data the above analysis was not performed on the Priv Sample.

9.2.2 Division of the samples into high willingness to comply and low willingness to comply subgroups

The willingness to comply variables WCC and WCM are the only variables apart from certainty, TC, which are essentially uncorrelated with other measures in the study. Therefore, it is possible to split the samples into high willingness to comply and low willingness to comply subgroups without appreciably affecting the variance, and probably the reliability, of other variables.

As there are two WC variables, each sample can be split into two subgroups on two different criteria: WCC scores and WCM scores. In each of the four categorization exercises, the scale value of the WC variable which was used as the cut-off point for the assignment of individuals to one group or the other was chosen to secure reasonably similar numbers of individuals in each group.

It was expected that high WCC individuals would have attitudes more similar to their coworkers' attitudes than low WCC individuals. In other words, it was expected that PC x attitude correlations would be higher in the high WCC group. Also, higher PC x B correlations were expected in the high WCC group: it was thought that individuals in this group would be more likely to exhibit behaviour which was approved by coworkers. Furthermore, it was thought that attitude x B correlations would be lower in the high WCC group because behaviour would be more under the influence of external (pressure) forces in this group than in the low WCC group.

Similar differences were expected for the high and low WCM groups, namely higher PM x attitude, higher PM x B and lower attitude x B correlations in the high WCM group.

In both samples, individuals with a WCC score less than 5 were assigned to the low WCC group. Different cut-offs were used in the two samples for the assignment of people into WCM groups: for the Priv Sample, subjects with WCM scores below 6 were assigned to the low group and for the Pub sample, subjects below 7 were classified into the low group. Table 18 lists the high WCC and low WCC correlations for the Priv sample. Table 19 presents high WCM and low WCM correlations also for the same sample. Tables 20 and 21 give comparable information for the Pub sample.

TABLE 18

Correlations Between Selected Variables in Low WCC and High WCC Groups: Priv Sample

	E		I		R	
	Low WCC (n=112)	High WCC (n=103)	Low WCC (n=112)	High WCC (n=103)	Low WCC (n=112)	High WCC (n=103)
PCxT	0,54	0,55	0,66	0,61	0,60	0,32
PCxL	0,50	0,52	0,61	0,69	0,62	0,43
PCxSD	0,54	0,55	0,66	0,63	0,63	0,39
PCxB	0,49	0,50	0,61	0,58	0,55	0,27
TxB	0,61	0,57	0,67	0,64	0,67	0,68
LxB	0,61	0,47	0,62	0,65	0,63	0,58
SDxB	0,61	0,58	0,62	0,65	0,68	0,57

TABLE 19

Correlations Between Selected Variables in Low WCM and High WCM Groups: Priv Sample

	E		I		R	
	Low WCM (n=88)	High WCM (n=127)	Low WCM (n=88)	High WCM (n=127)	Low WCM (n=88)	High WCM (n=127)
PMxT	0,36	0,58	0,56	0,64	0,27	0,54
PMxL	0,42	0,54	0,57	0,64	0,44	0,56
PMxSD	0,30	0,53	0,54	0,53	0,35	0,43
PMxB	0,44	0,50	0,56	0,60	0,42	0,52
TxB	0,62	0,59	0,69	0,64	0,71	0,66
LxB	0,65	0,48	0,68	0,63	0,70	0,55
SDxB	0,65	0,53	0,67	0,61	0,69	0,57

TABLE 20

Correlations Between Selected Variables in Low WCC and High WCC Groups: Pub Sample

	E		I		R	
	Low WCC (n=82)	High WCC (n=92)	Low WCC (n=82)	High WCC (n=92)	Low WCC (n=82)	High WCC (n=92)
PCxT	0,49	0,58	0,60	0,40	0,57	0,80
PCxL	0,49	0,57	0,69	0,63	0,55	0,55
PCxSD	0,40	0,29	0,48	0,35	0,45	0,22
PCxB	0,38	0,42	0,51	0,33	0,38	0,43
TxB	0,62	0,57	0,56	0,54	0,57	0,57
LxB	0,59	0,62	0,60	0,57	0,57	0,53
SDxB	0,42	0,47	0,53	0,56	0,49	0,42

TABLE 21

Correlations Between Selected Variables in Low WCM and High WCM Groups: Pub Sample

	E		I		R	
	Low WCC (n=101)	High WCC (n=73)	Low WCC (n=101)	High WCC (n=73)	Low WCC (n=101)	High WCC (n=73)
PMxT	0,31	0,66	0,38	0,48	0,31	0,68
PMxL	0,30	0,58	0,45	0,55	0,26	0,53
PMxSD	0,26	0,39	0,34	0,39	0,23	0,44
PMxB	0,19	0,56	0,32	0,47	0,25	0,48
TxB	0,59	0,59	0,54	0,55	0,56	0,57
LxB	0,59	0,64	0,58	0,57	0,58	0,49
SDxB	0,46	0,43	0,53	0,58	0,47	0,43

In both samples, the expected differences are not found in the WCC splits. There are no consistencies in the relative magnitudes of the correlations except for a tendency in the Priv R data for attitude x PC correlations to be lower in the high WCC group. This is the opposite of what was expected.

The WCM splits produce a much clearer picture. In the Priv sample, eight of the nine affect x PM correlations are numerically larger in the high WCM group; and in the Pub sample, all nine of these correlations are larger in the high WCM group. Although many of the correlations are not significantly larger than their counterparts, a clear trend can be seen. In both samples, all three PM x B correlations are larger in the high WCC group. In the Priv sample, all nine attitude x B correlations are lower in the high WCM group. No clear pattern emerges in the Pub sample.

In both samples, the corresponding PME, PMI and PMR means are essentially the same in the high WCM and low WCM groups. Hence, it cannot be said that individuals' level of willingness to comply with management coloured their perception of management's position on Black advancement issues. The higher PM x attitude correlations in the high WCM group probably indicate that individuals in this group adjusted their internal feelings about Black advancement to be more in keeping with management's view than did low WCM individuals.

This should not be taken to indicate that there is no causal influence between management attitude and own attitude in the low WCC group. In both groups, some interaction of this kind appears to have taken place. The fact that in both samples there is a substantial variance in PM scores, and that PM scores and own attitude scores correlate fairly substantially attests to some kind of one- or two-way influence between these factors.

9.2.3 Consistency of affective response and correlation with behaviour

Generally, the standard deviation (sd) statistic is used as an index of the variability of the scores of a number of individuals. There is no reason, however, why this statistic cannot be used to measure the amount of variability of a single individual's responses. In T scales, where each item measures on a ratio metric, the sd of the individual's item responses reflects the degree to which he varies in his evaluation of different aspects of the attitude object. It is to be expected that individuals with well crystallized attitudes would show little variability in their attitudinal responses and hence would have small scale sds. Those who have not co-ordinated their responses to a given attitude object into an integrated whole would be expected to have large scale sds. Furthermore, attitude should be a better predictor of behaviour amongst those individuals who have small attitude scale sds than amongst those whose attitude scale sd is large. This is because "well-formed" attitudes should provide more effective guidance of behaviour than "poorly formed" attitudes.

In order to investigate the effect of attitude scale consistency on behaviour, scale sds were calculated for all subjects on T, L and SD scales. The investigation is only fully justifiable on the ratio T scales, because these scales have a zero point. However, as the distributions of scores of the L and SD scales do not differ greatly from those of the T scale in each subdomain, all attitude scales were included in the investigation.

Subjects were divided into high sd and low sd groups on each scale. Table 22 gives the sd cut-offs used for assignment and the number of individuals in each group. The analysis was performed only on the Pub sample.

TABLE 22

Cut-offs and Group Sizes for the Low and High Standard Deviation Groups: Pub Sample

	E		I		R	
	Cut-off	n	Cut-off	n	Cut-off	n
	T					
Low sd	<0,99	87	<1,20	84	<0,90	80
High sd	>0,99	87	>1,20	89	>0,90	93
	L					
Low sd	<1,10	98	<1,10	87	<0,56	78
High sd	>1,10	76	>1,10	87	>0,56	96
	SD					
Low sd	<0,60	83	<0,52	90	<0,56	80
High sd	>0,60	76	>0,52	67	>0,56	78

The cut-offs were selected to make the two groups as nearly equal as possible.

In Table 23, the attitude x B and attitude x BI correlations are given for the low sd and high sd individuals.

A z_D of 1,96 corresponds to a 5% significance level. Inspection of Table 23 reveals that all correlation differences based on the T and most of those based on the L method are significant. All differences based on the SD method are non-significant, and in two pairs of correlations the high sd group's correlation is numerically (but not significantly) larger than that of the low sd group.

This is a suspicious state of affairs which requires further investigation. The SD scales differ from the other scales in that they have more item alternatives and larger standard deviations (standard deviation to be understood in the conventional sense, not the one which has been used to indicate internal variability). The correlation between two manifest variabes x and y is a multiplicative function of the following:

(1) The correlation of x with its underlying trait T_1.

(2) The correlation of y with its underlying trait T_2.

(3) The correlation between T_1 and T_2.

TABLE 23

Attitude x BI and Attitude x B Correlations in Low and High Standard Deviation Groups: Pub Sample

	BI			B		
	E	I	R	E	I	R
	T					
Low sd	0,8471	0,8148	0,8741	0,6908	0,6515	0,7123
High sd	0,6705	0,5260	0,6059	0,4920	0,3763	0,5010
z_D	2,82	3,59	4,18	2,02	2,46	2,20
	L					
Low sd	0,7415	0,7210	0,8400	0,6590	0,6544	0,6805
High sd	0,6930	0,7009	0,5628	0,4513	0,4155	0,2094
z_D	0,641	0,266	3,77	1,96	2,21	3,99
	SD					
Low sd	0,6497	0,7081	0,8198	0,5624	0,6384	0,5442
High sd	0,7176	0,6436	0,7900	0,5875	0,5680	0,4924
z_D	0,790	0,721	0,525	0,235	0,673	0,438

In other words, the correlation between two variables depends on the reliabilities of the two variables and the correlation between the two underlying dimensions which the variables are measuring.

The size of a variable's standard deviation (conventional use of the term) generally affects its reliability: larger standard deviations are usually concomitant with higher reliabilities.

The sd splits which were performed here might have affected scale standard deviations (conventional use) in the two groups. Individuals with large intra-scale variability cannot have very high or very low scores, because an extreme score implies consistency. Therefore the scale scores of the high sd individuals are likely to be concentrated in the central area of the scale and the scale standard deviation will be constricted.

It may be argued that low scale reliability is an inevitable feature of data collected on individuals who do not have a consistent response to the concept under consideration and that low reliability should not be used to argue away very real differences in the scale's predictive power in high and low consistency groups. In order to investigate this issue rigorously, a way was sought to incorporate sd into a prediction function instead of using it as a basis for making splits.

One possibility is to divide the scale total by sd: individuals with large sds would then receive smaller scores. In order for this statistic to be usable, two requirements must be satisfied. Firstly, the effect of sd must be symmetrical about the point of indifference; secondly a constant must be added to the denominator to prevent it from ever assuming a value of zero. This transformation can be done only on the T scales with full justification, as the T items have a zero point. The following is the transformation.

$$T'' = \frac{T - 12}{\sigma_W + c}$$

where

T'' is the transformation,

σ_W is the individual's within-scale sd, and

c is some positive constant.

For the purpose of this study, c was arbitrarily chosen to be unity.

Although the above transformation on L and SD scales is not fully justified, it was nevertheless done for comparison purposes. The value subtracted from the scale score was the value of the midpoint of that scale.

Table 24 presents the means and standard deviations of the transformed scales.

TABLE 24

Means and Standard Deviations of T" Transforms: Pub Sample

	E		I		R	
	Mean	σ	Mean	σ	Mean	σ
T	0,403	2,629	-0,489	2,298	-0,445	2,766
L	0,164	2,390	0,015	2,809	-0,021	3,386
SD	1,542	5,322	-0,359	6,637	-0,223	6,050

The maximum possible ranges of the transformed scales are the same as those of their original counterparts. The T" scales, for instance, span the 16-point range from -8 to 8, whereas the original T scales span the range from 4 to 20. Standard deviations of the transformed scales are somewhat less than those of the criginals.

Table 25 presents the correlations of the transformed scales and original scales with behaviour in the relevant subdomain.

TABLE 25

Correlations of Attitude and Transformed Attitude Scales with corresponding B Scales: Pub Sample

	E	I	R
T	0,61	0,55	0,57
T"	0,58	0,51	0,55
L	0,61	0,58	0,55
L"	0,58	0,54	0,54
SD	0,59	0,63	0,54
SD"	0,56	0,57	0,49

Table 25 shows that the transformed scores do not correlate more highly with the behavioural criterion: on the contrary, there is a suggestion of a slight decline in predictive power.

Other values of the constant c which were tried did not improve the prediction of the transformed scores appreciably.

It seems then, that intra-scale sd cannot be used profitably to improve affect-behaviour prediction. The results presented in Table 25 illustrate how deceptive the comparison of correlation magnitudes can be in some instances. The failure of the SD scales to follow the trend in Table 23 is probably due to the large number of item alternatives, large variance and high reliability of these scales.

10.0 BLACK ADVANCEMENT DATA ANALYSIS II: DISCRIMINANT ANALYSIS

In this chapter and in Chapter 12 we shall be examining multivariate prediction models. Discriminant analysis will be used in this chapter and structural equation analysis in Chapter 12. The two analyses differ in certain fundamental ways.

(i) In discriminant analyses, the aim is to assign observations to categories with a low error rate. The categories of interest in the present study are different kinds of behaviour. In structural equation analysis, the adequacy of a precisely specified model of behaviour prediction is under scrutiny. Hence the emphasis is on the whole model rather than on prediction alone.

(ii) In structural equation analysis the relationships among all variables must be specified, whereas in discriminant analysis the aim is to derive linear combinations of predictors to assign observations to classes as accurately as possible. The network of interrelationships amongst variables is not of primary interest.

(iii) In discriminant analysis, the regression coefficients are generally based on variables which are not error-free. In structural equation analysis, regression coefficients between latent variables may be derived if a multiple measurement strategy has been adopted.

Discriminant analysis enables the experimenter to investigate the predictive power of sets of predictors and the effectiveness of prediction can be gauged directly by the proportion of observations correctly assigned to each category.

Examination of Table 8 which lists the proportions of individuals falling in the positive, negative and anonymous behavioural categories shows that all three categories were used substantially in the Pub sample, but that the negative category was little used in the Priv sample. It was decided to exclude the individuals who had given negative responses in the Priv sample and consider only those who had given positive and neutral responses. In the Pub sample, some prediction exercises involved two criterion groups and others three groups. Altogether, there were four possible prediction situations in the Pub sample: prediction of membership of all three categories; of the positive and negative categories; of the positive and anonymous categories; and of the anonymous and negative categories. In the Priv sample there was only one prediction situation: that involving the positive and neutral categories.

A complication was that there are two sets of behavioural categories: identifying oneself to the NIPR as a supporter or opponent of various Black advancement issues and identifying oneself to the management of one's organization as a supporter or opponent of these issues. There are two ways of handling data of this type in a discriminant analysis context. The first involves excluding all individuals who did not respond in the same way in the two self-identification exercises. If, for instance, an individual responded positively to the first self-identification item but remained anonymous in the second, he would be excluded. The second option is to do two sets of analyses: one for each self-identification exercise.

It was decided to adopt the second course of action because the first would have involved the loss of an appreciable number of subjects from the analysis.

Table 26 summarizes the basic structure of the analysis strategy.

TABLE 26

Basic Discriminant Analysis Strategy

Prediction Categories	Criterion	Sample Analyzed		
		E	I	R
Positive/Negative	B1	Pub	Pub	Pub
Positive/Negative	B2	Pub	Pub	Pub
Positive/Anonymous	B1	Priv/Pub	Priv/Pub	Priv/Pub
Positive/Anonymous	B2	Priv/Pub	Priv/Pub	Priv/Pub
Anonymous/Negative	B1	Pub	Pub	Pub
Anonymous/Negative	B2	Pub	Pub	Pub
Positive/Anonymous/Negative	B1	Pub	Pub	Pub
Positive/Anonymous/Negative	B2	Pub	Pub	Pub

The main predictor variables included in the analysis were the following: attitude (affect), consequences (cognition), managerial pressure and coworker pressure. Behavioural intention was excluded from most analyses in order to eliminate behaviourally orientated variables from the prediction set. Other variables, such as WCC, WCM, within-scale sds and attitudinal certainty were included in some sets of analyses.

As was mentioned in Chapter 7, the BMDP stepwise discriminant analysis programme was used in this study. No variables were forced into the predictor sets. Hence, the first variable selected by the programme was always the one with the largest F-ratio; the second was the one which offered the best improvement on the first variable's predictive power; and so forth. A minimum F-to-enter ratio of 4 was set: this ratio is very close to the 0,05 significance level for all analyses reported here. Once the situation was reached that no variable met this criterion, the selection procedure terminated. A detailed description of the technique is given in Chapter 7.

We shall present the results of the different prediction exercises separately.

10.1 Prediction of Positive and Negative Behaviour

This prediction exercise was performed on Pub data only. The positive and negative categories are distinct and "opposite". Consequently, this prediction exercise should be the easiest.

We shall refer to the first behaviour (giving one's name to the NIPR) as B1 and the second (signing a statement releasing one's name to one's employers) as B2.

The output of the BMDP discriminant analysis programme is extensive; only certain parts of it will be presented and discussed here. We shall report the following information on the positive/negative behaviour prediction exercise: category means of all variables included in the analysis; initial F-ratios of all variables; a listing of all variables selected and their F-to-enter ratios; numbers and percentages of individuals correctly classified into each category; canonical correlations and canonical coefficients. In the two category case, canonical correlations are equivalent to multiple Rs. The canonical coefficients are used as follows to assign individuals to categories. Each selected variable is weighted by its canonical coefficient; if the sum of the weighted scores and the constant of the canonical equation exceeds zero, the individual is assigned to one group (in this case, the negative group); if the above-mentioned weighted sum is less than zero, the individual is assigned to the other group (the positive one).

The initial F-ratios of all variables have degrees of freedom g-1, N-g, where N is the number of individuals in all groups under consideration and g is the number of groups. For each subsequent variable entered, the magnitude of the second argument is reduced by one. In a two-group case, for instance, where the total number of individuals is 108, the initial F-ratios will have degrees of freedom 1,106; after the first variable has been entered, the potential of remaining variables to improve prediction is expressed as an F-ratio with degrees of freedom 1,105. If a further variable is selected, the F-to-enter ratios of the remaining variables will have degrees of freedom 1,104, and so forth. Variables were not standardized in any of the discriminant analyses reported here. However, the scores of the main variables (attitude, consequences, pressure) were transformed as follows:

$$\text{Transformed Score} = \frac{\text{Old Score - Minimum possible for the scale}}{\text{Scale Range}}$$

The transformation gives variables the same range (from zero to unity) but does not standardize variances. This has an advantage over conventional standardization in that a valid characteristic of a variable (its variance) is not made uniform; but all variables have the same range and therefore are easily compared.

The following variables were included in the analysis we are about to present:

(1) Attitude.

(2) Coworker pressure.

(3) Managerial pressure.

(4) Consequences.

(5) Willingness to comply with coworkers.

(6) Willingness to comply with management.

(7) The product of (2) and (5).

(8) The product of (3) and (6).

Variables (7) and (8) were included because some of the literature indicates that the product of perceived social pressure and willingness to comply with the pressure is a better predictor than perceived social pressure alone. For the E, I and R subdomains, variable (7) will be designated by the codes CWE, CWI and CWR respectively. Corresponding codes for variable (8) are MGE, MGI and MGR.

A separate discriminant analysis was conducted for each attitude measure. Hence, there were separate analyses for the T, L and SD methods. Altogether, 18 analyses were performed (3 attitude methods x 2 behavioural criteria x 3 subdomains). In each analysis only protocols complete for the variables under consideration were included.

We shall report on the three subdomains separately. Tables 27 to 29 present the results for the E subdomain. Tables 30 to 32 list the results for the I subdomain and Tables 33 to 35 for the R subdomain. Each table incorporates the results of two analyses: prediction of B1 and prediction of B2.

The following conclusions can be drawn from Tables 27 to 35:

(i) Attitude is a strong predictor in all three subdomains. In the E and R subdomains, it is the strongest, and in the I subdomain either the strongest or the second-strongest.

(ii) In the E subdomain, management-related considerations played a role in behaviour prediction. The B1 and B2 prediction exercises produced slightly different results. In the prediction of B1, the significant predictors after attitude are perceived management orientation (PME) and willingness to comply with management's position (WCM). In the prediction of B2, the product variable MGE (PME x WCM) typically emerged as the significant predictor after attitude. Hence, in the prediction of B1, an additive combination of PME and WCM was selected, whereas in the prediction of B2 a

TABLE 27

Positive-Negative Discriminant Analysis Results for the E Subdomain
Using T Attitude Scale: Pub Sample

	PREDICTION OF B1			PREDICTION OF B2			
	Means		F-ratio	Means		F-ratio	
	Neg. Beh. n=24	Pos. Beh. n=49		Neg. Beh. n=20	Pos. Beh. n=35		
TE	0,300	0,719	85,596	0,335	0,749	85,395	TE
WCC	0,349	0,380	0,229	0,350	0,368	0,054	WCC
WCM	0,453	0,571	3,108	0,431	0,564	2,792	WCM
PCE	0,267	0,507	34,051	0,296	0,519	22,521	PCE
PME	0,378	0,604	39,994	0,454	0,602	12,158	PME
CE	0,325	0,565	22,457	0,333	0,560	15,019	CE
CWE	0,090	0,193	9,298	0,096	0,192	5,849	CWE
MGE	0,140	0,341	28,400	0,151	0,341	18,388	MGE

Variables Entered	F-to-enter	Variables Entered	F-to-enter
TE	85,596	TE	85,395
PME	11,781	MGE	6,801
WCM	9,276		

	CLASSIFICATION MATRIX			CLASSIFICATION MATRIX			
	Percent Correct	Cases Classified into Group		Percent Correct	Cases Classified into Group		
		Neg.Beh.	Pos.Beh.		Neg.Beh.	Pos.Beh.	
Neg.Beh.	95,8	23	1	85,0	17	3	Neg.Beh.
Pos.Beh.	91,8	4	45	97,1	1	34	Pos.Beh.
Total	93,2			92,7			Total

Canonical Correlation: 0,811	Canonical Correlation: 0,813

Canonical Coefficients		Canonical Coefficients	
TE: -4,240	WCM: -1,684	TE: -6,183	MGE: -3,031
PME: -4,152	Constant: 5,559	Constant: 4,176	

TABLE 28

Positive-Negative Discriminant Analysis Results for the E Subdomain Using L Attitude Scale: Pub Sample

	PREDICTION OF B1			PREDICTION OF B2			
	Means		F-ratio	Means		F-ratio	
	Neg. Beh. n=23	Pos. Beh. n=49		Neg. Beh. n=20	Pos. Beh. n=35		
LE	0,318	0,681	72,236	0,313	0,693	65,613	LE
WCC	0,348	0,380	0,236	0,350	0,368	0,054	WCC
WCM	0,435	0,571	4,121	0,431	0,564	2,792	WCM
PCE	0,272	0,507	31,614	0,296	0,519	22,521	PCE
PME	0,384	0,604	36,874	0,454	0,602	12,158	PME
CE	0,330	0,565	20,713	0,333	0,560	15,019	CE
CWE	0,091	0,193	8,709	0,096	0,192	5,849	CWE
MGE	0,136	0,341	28,253	0,151	0,341	18,388	MGE

Variables Entered	F-to-enter	Variables Entered	F-to-enter
LE	72,236	LE	65,613
PME	10,739		
WCM	4,897		

	CLASSIFICATION MATRIX			CLASSIFICATION MATRIX			
	Percent Correct	Cases Classified into Group		Percent Correct	Cases Classified into Group		
		Neg.Beh.	Pos.Beh.		Neg.Beh.	Pos.Beh.	
Neg.Beh.	91,3	21	2	90,0	18	2	Neg.Beh.
Pos.Beh.	91,8	4	45	77,1	8	27	Pos.Beh.
Total	91,7			81,8			Total

Canonical Correlation: 0,776	Canonical Correlation: 0,744

Canonical Coefficients	Canonical Coefficients
LE: -4,188 WCM: -1,337	LE: -5,969
PME: -4,102 Constant: 5,261	Constant: 3,312

TABLE 29

Positive-Negative Discriminant Analysis Results for the E Subdomain Using SD Attitude Scale: Pub Sample

	PREDICTION OF B1			PREDICTION OF B2			
	Means		F-ratio	Means		F-ratio	
	Neg. Beh. n=23	Pos. Beh. n=46		Neg. Beh. n=19	Pos. Beh. n=33		
SDE	0,322	0,804	84,192	0,303	0,826	80,364	SDE
WCC	0,348	0,372	0,140	0,336	0,356	0,073	WCC
WCM	0,451	0,560	2,466	0,414	0,545	2,630	WCM
PCE	0,272	0,504	29,244	0,298	0,515	19,329	PCE
PME	0,388	0,607	35,807	0,452	0,603	11,554	PME
CE	0,328	0,572	21,430	0,344	0,561	12,550	CE
CWE	0,091	0,188	8,180	0,093	0,186	5,500	CWE
MGE	0,142	0,336	24,631	0,139	0,331	18,283	MGE

Variables Entered	F-to-enter	Variables Entered	F-to-enter
SDE	84,192	SDE	80,364
PME	12,955	MGE	5,074
WCM	4,540		

	CLASSIFICATION MATRIX			CLASSIFICATION MATRIX			
	Percent Correct	Cases Classified into Group		Percent Correct	Cases Classified into Group		
		Neg.Beh.	Pos.Beh.		Neg.Beh.	Pos.Beh.	
Neg.Beh.	87,0	20	3	78,9	15	4	Neg.Beh.
Pos.Beh.	93,5	3	43	97,0	1	32	Pos.Beh.
Total	91,3			90,4			Total

Canonical Correlation: 0,809	Canonical Correlation: 0,801

Canonical Coefficients		Canonical Coefficients	
SDE: -3,771	WCM: -1,243	SDE: -4,439	MGE: -2,420
PME: -4,198	Constant: 5,319	Constant: 3,449	

TABLE 30

Positive-Negative Discriminant Analysis Res
Using T Attitude Scale: Pub Sample

	PREDICTION OF B1			PREDICTION OF B2			
	Means		F-ratio	Means		F-ratio	
	Neg. Beh. n=24	Pos. Beh. n=55		Neg. Beh. n=32	Pos. Beh. n=25		
TI	0,268	0,570	46,468	0,330	0,695	67,356	TI
WCC	0,328	0,398	1,240	0,406	0,330	1,114	WCC
WCM	0,448	0,564	3,084	0,504	0,530	0,113	WCM
PCI	0,201	0,424	37,948	0,247	0,480	33,151	PCI
PMI	0,327	0,512	22,585	0,344	0,537	19,903	PMI
CI	0,191	0,573	67,204	0,253	0,677	75,379	CI
CWI	0,068	0,158	12,271	0,106	0,154	2,502	CWI
MGI	0,145	0,288	15,124	0,172	0,290	8,133	MGI

Variables Entered	F-to-enter	Variables Entered	F-to-enter
CI	67,204	CI	75,379
TI	4,527	TI	8,969
		WCC	4,022

	CLASSIFICATION MATRIX			CLASSIFICATION MATRIX			
	Percent Correct	Cases Classified into Group		Percent Correct	Cases Classified into Group		
		Neg.Beh.	Pos.Beh.		Neg.Beh.	Pos.Beh.	
Neg.Beh.	91,7	22	2	84,4	27	5	Neg.Beh.
Pos.Beh.	83,6	9	46	96,0	1	24	Pos.Beh.
Total	86,1			89,5			Total

Canonical Correlation: 0,704	Canonical Correlation: 0,815

Canonical Coefficients	Canonical Coefficients
TI: -2,196 CI: -3,841 Constant: 2,806	TI: -3,001 WCC: 1,250 CI: -3,753 Constant: 2,651

TABLE 31

Positive-Negative Discriminant Analysis Results for the I Subdomain
Using L Attitude Scale: Pub Sample

	PREDICTION OF B1			PREDICTION OF B2			
	Means		F-ratio	Means		F-ratio	
	Neg. Beh. n=24	Pos. Beh. n=55		Neg. Beh. n=32	Pos. Beh. n=25		
LI	0,255	0,656	83,656	0,364	0,755	53,900	LI
WCC	0,328	0,398	1,240	0,406	0,330	1,114	WCC
WCM	0,448	0,564	3,084	0,504	0,530	0,113	WCM
PCI	0,201	0,424	37,948	0,247	0,480	33,151	PCI
PMI	0,327	0,512	22,585	0,344	0,537	19,903	PMI
CI	0,191	0,573	67,204	0,253	0,677	75,379	CI
CWI	0,068	0,158	12,271	0,106	0,154	2,502	CWI
MGI	0,145	0,288	15,124	0,172	0,290	8,133	MGI

Variables Entered	F-to-enter	Variables Entered	F-to-enter
LI	83,656	CI	75,379
WCC	7,107	LI	5,477
CI	4,925		

	CLASSIFICATION MATRIX			CLASSIFICATION MATRIX			
	Percent Correct	Cases Classified into Group		Percent Correct	Cases Classified into Group		
		Neg.Beh.	Pos.Beh.		Neg.Beh.	Pos.Beh.	
Neg.Beh.	87,5	21	3	81,3	26	6	Neg.Beh.
Pos.Beh.	90,9	5	50	92,0	2	23	Pos.Beh.
Total	89,9			86,0			Total

Canonical Correlation: 0,767	Canonical Correlation: 0,785

Canonical Coefficients	Canonical Coefficients
LI: -4,232 WCC: -1,350	LI: -2,200 CI: -3,895
CI: -2,038 Constant: 3,701	Constant: 2,886

TABLE 32

Positive-Negative Discriminant Analysis Results for the I Subdomain Using SD Attitude Scale: Pub Sample

	PREDICTION OF B1			PREDICTION OF B2			
	Means		F-ratio	Means		F-ratio	
	Neg. Beh. n=23	Pos. Beh. n=52		Neg. Beh. n=30	Pos. Beh. n=25		
SDI	0,158	0,717	100,641	0,278	0,855	82,940	SDI
WCC	0,326	0,392	1,097	0,379	0,330	0,485	WCC
WCM	0,446	0,553	2,502	0,479	0,530	0,432	WCM
PCI	0,203	0,433	39,898	0,242	0,480	34,542	PCI
PMI	0,312	0,527	33,591	0,347	0,537	18,445	PMI
CI	0,183	0,582	76,998	0,240	0,677	79,731	CI
CWI	0,068	0,162	12,196	0,097	0,154	3,524	CWI
MGI	0,136	0,294	17,388	0,167	0,290	8,342	MGI

Variables Entered	F-to-enter	Variables Entered	F-to-enter
SDI	100,641	SDI	82,940
CI	6,354	CI	9,255

	CLASSIFICATION MATRIX			CLASSIFICATION MATRIX			
	Percent Correct	Cases Classified into Group		Percent Correct	Cases Classified into Group		
		Neg.Beh.	Pos.Beh.		Neg.Beh.	Pos.Beh.	
Neg.Beh.	91,3	21	2	83,3	25	5	Neg.Beh.
Pos.Beh.	88,5	6	46	100,0	0	25	Pos.Beh.
Total	89,3			90,9			Total

Canonical Correlation: 0,783	Canonical Correlation: 0,818

Canonical Coefficients	Canonical Coefficients
SDI: -3,112 CI: -2,391 Constant: 2,798	SDI: -2,527 CI: -3,081 Constant: 2,717

TABLE 33

Positive-Negative Discriminant Analysis Results for the R Subdomain Using T Attitude Scale: Pub Sample

	PREDICTION OF B1			PREDICTION OF B2			
	Means		F-ratio	Means		F-ratio	
	Neg. Beh. n=31	Pos. Beh. n=47		Neg. Beh. n=21	Pos. Beh. n=30		
TR	0,278	0,665	76,469	0,289	0,713	58,201	TR
WCC	0,440	0,338	3,039	0,411	0,317	1,698	WCC
WCM	0,520	0,561	0,422	0,506	0,529	0,073	WCM
PCR	0,288	0,534	45,984	0,333	0,519	12,931	PCR
PMR	0,489	0,638	14,543	0,452	0,683	22,799	PMR
CR	0,210	0,418	24,575	0,206	0,447	22,843	CR
CWR	0,132	0,177	2,540	0,140	0,168	0,657	CWR
MGR	0,240	0,358	8,037	0,218	0,362	5,940	MGR

Variables Entered	F-to-enter	Variables Entered	F-to-enter
TR	76,496	TR	58,201
PCR	7,987	PMR	6,961

	CLASSIFICATION MATRIX			CLASSIFICATION MATRIX			
	Percent Correct	Cases Classified into Group		Percent Correct	Cases Classified into Group		
		Neg.Beh.	Pos.Beh.		Neg.Beh.	Pos.Beh.	
Neg.Beh.	87,1	27	4	85,7	18	3	Neg.Beh.
Pos.Beh.	89,4	5	42	96,7	1	29	Pos.Beh.
Total	88,5			92,2			Total

Canonical Correlation: 0,741	Canonical Correlation: 0,775

Canonical Coefficients	Canonical Coefficients
TR: -3,954 PCR: -2,840 Constant: 3,261	TR: -4,283 PMR: -2,718 Constant: 3,904

TABLE 34

Positive-Negative Discriminant Analysis Results for the R Subdomain
Using L Attitude Scale: Pub Sample

	PREDICTION OF B1			PREDICTION OF B2			
	Means		F-ratio	Means		F-ratio	
	Neg. Beh. n=31	Pos. Beh. n=47		Neg. Beh. n=21	Pos. Beh. n=30		
LR	0,333	0,705	55,421	0,325	0,761	56,083	LR
WCC	0,440	0,338	3,039	0,411	0,317	1,698	WCC
WCM	0,520	0,561	0,422	0,506	0,529	0,073	WCM
PCR	0,288	0,534	45,984	0,333	0,519	12,931	PCR
PMR	0,489	0,638	14,543	0,452	0,683	22,799	PMR
CR	0,210	0,418	24,575	0,206	0,447	22,843	CR
CWR	0,132	0,177	2,540	0,140	0,168	0,657	CWR
MGR	0,240	0,358	8,037	0,218	0,362	5,940	MGR

Variables Entered	F-to-enter	Variables Entered	F-to-enter
LR PCR	55,421 14,538	LR PMR	56,083 12,079

	CLASSIFICATION MATRIX			CLASSIFICATION MATRIX			
	Percent Correct	Cases Classified into Group		Percent Correct	Cases Classified into Group		
		Neg.Beh.	Pos.Beh.		Neg.Beh.	Pos.Beh.	
Neg.Beh.	77,4	24	7	85,7	18	3	Neg.Beh.
Pos.Beh.	87,2	6	41	96,7	1	29	Pos.Beh.
Total	83,3			92,2			Total

Canonical Correlation: 0,718	Canonical Correlation: 0,792

Canonical Coefficients	Canonical Coefficients
LR: -3,144 PCR: -3,701 Constant: 3,365	LR: -4,162 PMR: -3,333 Constant: 4,379

TABLE 35

Positive-Negative Discriminant Analysis Results for the R Subdomain Using SD Attitude Scale: Pub Sample

	PREDICTION OF B1			PREDICTION OF B2			
	Means		F-ratio	Means		F-ratio	
	Neg. Beh. n=29	Pos. Beh. n=44		Neg. Beh. n=20	Pos. Beh. n=30		
SDR	0,299	0,725	46,567	0,265	0,786	56,293	SDR
WCC	0,435	0,327	3,401	0,400	0,317	1,289	WCC
WCM	0,513	0,548	0,290	0,494	0,529	0,165	WCM
PCR	0,282	0,532	44,279	0,325	0,519	13,678	PCR
PMR	0,486	0,640	13,954	0,454	0,683	21,385	PMR
CR	0,217	0,435	25,618	0,210	0,447	21,105	CR
CWR	0,127	0,172	2,549	0,131	0,168	1,106	CWR
MGR	0,235	0,351	7,200	0,213	0,362	6,057	MGR

Variables Entered	F-to-enter	Variables Entered	F-to-enter
SDR	46,567	SDR	56,293
PCR	12,664	PMR	5,525

	CLASSIFICATION MATRIX			CLASSIFICATION MATRIX			
	Percent Correct	Cases Classified into Group		Percent Correct	Cases Classified into Group		
		Neg.Beh.	Pos.Beh.		Neg.Beh.	Pos.Beh.	
Neg.Beh.	79,3	23	6	80,0	16	4	Neg.Beh.
Pos.Beh.	86,4	6	38	90,0	3	27	Pos.Beh.
Total	83,6			86,0			Total

Canonical Correlation: 0,699	Canonical Correlation: 0,767

Canonical Coefficients	Canonical Coefficients
SDR: -2,398 PCR: -3,781 Constant: 2,970	SDR: -3,488 PMR: -2,493 Constant: 3,490

multiplicative combination of these variables proved more effective.

(iii) In the I subdomain, consequences (CI) emerged as the most powerful predictor in many of the analyses, with attitude adding significant extra predictive power.

(iv) A clear dichotomy emerged in the prediction of B1 and B2 in the R subdomain. In the prediction of B1, coworker pressure (PCR) had significant predictive power in addition to that of the attitude measure. In the prediction of B2, management pressure (PMR) augmented the predictive power of attitude.

(v) All the main predictors (attitude, management pressure, coworker pressure and consequences) have highly significant F-ratios. This result is not unexpected in the light of the confirmation of Hypothesis 1.

These results offer support for Hypothesis 2 only in a weak sense. Attitude, management pressure, coworker pressure and consequences all emerged as significant predictors, but not simultaneously. In most cases a selection of just two from the above set was sufficient to exhaust virtually all the predictive power of the set. Attitude was the most consistently good predictor.

10.2 Prediction of Positive and Neutral Behaviour

This prediction exercise was performed on both Priv and Pub data. The findings of the positive/negative prediction exercise were reported quite comprehensively because these findings were the clearest and most noteworthy. The nine tables which present the positive/neutral behaviour prediction results will be briefer and contain only the following: variables entered; classification matrices; and canonical correlations. Four sets of results will be presented in each table: prediction of B1 and B2 in the Priv and Pub samples.

In order to try to improve prediction in this more difficult exercise, several new variables were added to the set of potential predictors. These are: attitudinal certainty, TC, of the T scale (this was included only for those analyses incorporating a T scale); and the internal sds of the attitude, coworker pressure, management pressure and consequences scales. The sd variables were designated by affixing an S in front of the relevant scale's name. The internal sd for the CE scale for instance was called SCE. For brevity, we shall designate the Priv sample S1 and the Pub sample S2. Analyses will be indicated by four alphanumerics, two indicating the sample and two the criterion. The string S1B2, for instance, will designate the analysis involving the prediction of B2 based on Priv data.

The results are presented in Tables 36 to 42.

TABLE 36

Positive-Neutral Discriminant Analysis Results for the E Subdomain Using T Attitude Scale

Variables Entered	
S1B1: TE, TCE, PCE	S2B1: TE, TCE
S1B2: TE, TCE, PCE	S2B2: TE, TCE

	CLASSIFICATION MATRICES					
	Classification: S1			Classification: S2		
Group	% Correct	No Beh.	Pos. Beh.	% Correct	No Beh.	Pos. Beh.
No Beh. B1	75,3	67	22	74,5	73	25
B2	79,4	81	21	73,9	85	30
Pos.Beh. B1	76,0	24	76	76,6	11	36
B2	79,8	19	75	82,4	6	28

Canonical Correlations			
S1B1: 0,617	S1B2: 0,668	S2B1: 0,527	S2B2: 0,494

The following general conclusions can be derived from the results reported in Tables 36 to 44.

(i) Not surprisingly, the accuracy of prediction in the positive-neutral prediction exercise is appreciably poorer than that achieved in the positive-negative exercise.

(ii) In almost all prediction exercises involving the T scales, the intensity or certainty score TC added significantly to the prediction. It will be remembered that Postulate 1 posited that a multiplicative function of T and TC would predict behaviour more

TABLE 37

Positive-Neutral Discriminant Analysis Results for the E Subdomain
Using L Attitude Scale

Variables Entered	
S1B1: LE, PCE, SLE, SCE S1B2: LE, PCE, SLE, SCE	S2B1: LE S2B2: LE, SPME

	CLASSIFICATION MATRICES					
	Classification: S1			Classification: S2		
Group	% Correct	No Beh.	Pos. Beh.	% Correct	No Beh.	Pos. Beh.
No Beh. B1	73,0	65	24	76,5	75	23
B2	78,4	80	22	75,9	88	28
Pos.Beh. B1	78,0	22	78	69,4	15	34
B2	83,0	16	78	74,3	9	26

Canonical Correlations			
S1B1: 0,609	S1B2: 0,606	S2B1: 0,516	S2B2: 0,473

TABLE 38

Positive-Neutral Discriminant Analysis Results for the E Subdomain
Using SD Attitude Scale

Variables Entered	
S1B1: SDE, PCE, SCE S1B2: SDE, PCE	S2B1: SDE, MGE, PME, SCE S2B2: SDE, MGE, PME

	CLASSIFICATION MATRICES					
	Classification: S1			Classification: S2		
Group	% Correct	No Beh.	Pos. Beh.	% Correct	No Beh.	Pos. Beh.
No Beh. B1	56,9	37	28	72,1	62	24
B2	61,5	48	30	71,8	74	29
Pos.Beh. B1	80,9	18	76	71,7	13	33
B2	85,2	13	75	81,8	6	27

Canonical Correlations			
S1B1: 0,569	S1B2: 0,573	S2B1: 0,547	S2B2: 0,482

TABLE 39

Positive-Neutral Discriminant Analysis Results for the I Subdomain Using T Attitude Scale

Variables Entered	
S1B1: TI, TCI, PMI, CI	S2B1: TI, CWI
S1B2: TI, TCI, PCI, PMI	S2B2: TI

	CLASSIFICATION MATRICES					
	Classification: S1			Classification: S2		
Group	% Correct	No Beh.	Pos. Beh.	% Correct	No Beh.	Pos. Beh.
No Beh. B1	75,3	73	24	69,9	65	28
B2	76,6	85	26	73,7	84	30
Pos.Beh. B1	84,8	15	84	70,4	16	38
B2	85,9	12	73	88,0	3	22

Canonical Correlations			
S1B1: 0,676	S1B2: 0,662	S2B1: 0,432	S2B2: 0,510

TABLE 40

Positive-Neutral Discriminant Analysis Results for the I Subdomain Using L Attitude Scale

Variables Entered	
S1B1: LI, PMI, CI	S2B1: LI, CWI
S1B2: LI, PMI, PCI	S2B2: LI

	CLASSIFICATION MATRICES					
	Classification: S1			Classification: S2		
Group	% Correct	No Beh.	Pos. Beh.	% Correct	No Beh.	Pos. Beh.
No Beh. B1	70,1	68	29	66,7	62	31
B2	74,8	83	28	60,9	70	45
Pos.Beh. B1	91,8	8	90	70,9	16	39
B2	85,7	12	72	60,0	10	15

Canonical Correlations			
S1B1: 0,635	S1B2: 0,615	S2B1: 0,435	S2B2: 0,449

TABLE 41

Positive-Neutral Discriminant Analysis Results for the I Subdomain Using SD Attitude Scale

Variables Entered	
S1B1: SDI, PMI, CI	S2B1: SDI, CWI
S1B2: SDI, PMI, PCI	S2B2: SDI

	CLASSIFICATION MATRICES					
	Classification: S1			Classification: S2		
Group	% Correct	No Beh.	Pos. Beh.	% Correct	No Beh.	Pos. Beh.
No Beh. B1	70,6	48	20	68,8	55	25
B2	75,9	63	20	69,0	69	31
Pos.Beh. B1	85,9	13	79	75,0	13	39
B2	88,3	9	68	88,0	3	22

Canonical Correlations			
S1B1: 0,624	S1B2: 0,659	S2B1: 0,471	S2B2: 0,508

TABLE 42

Positive-Neutral Discriminant Analysis Results for the R Subdomain Using T Attitude Scale

Variables Entered	
S1B1: TR, TCR, PMR, CR	S2B1: TR, TCR
S1B2: TR, TCR, PMR, CR	S2B2: TR, TCR, PMR

	CLASSIFICATION MATRICES					
	Classification: S1			Classification: S2		
Group	% Correct	No Beh.	Pos. Beh.	% Correct	No Beh.	Pos. Beh.
No Beh. B1	82,7	81	17	74,7	68	23
B2	83,1	98	20	77,8	91	26
Pos.Beh. B1	81,4	16	70	82,6	8	38
B2	83,8	12	62	80,0	6	24

Canonical Correlations			
S1B1: 0,717	S1B2: 0,717	S2B1: 0,519	S2B2: 0,553

TABLE 43

Positive-Neutral Discriminant Analysis Results for the R Subdomain Using L Attitude Scale

Variables Entered	
S1B1: LR, PMR, CR S1B2: LR, PMR, SCR	S2B1: LR, PMR, CR, SLR S2B2: LR, PMR

	CLASSIFICATION MATRICES					
	Classification: S1			Classification: S2		
Group	% Correct	No Beh.	Pos. Beh.	% Correct	No Beh.	Pos. Beh.
No Beh. B1	68,4	67	31	77,2	71	21
B2	73,1	87	32	72,9	86	32
Pos.Beh. B1	83,5	14	71	73,9	12	34
B2	87.7	9	64	86,7	4	26

Canonical Correlations			
S1B1: 0,643	S1B2: 0,631	S2B1: 0,591	S2B2: 0,538

TABLE 44

Positive-Neutral Discriminant Analysis Results for the R Subdomain Using SD Attitude Scale

Variables Entered	
S1B1: SDR, PMR, CR S1B2: SDR, PMR, CR	S2B1: SDR S2B2: SDR, PMR

	CLASSIFICATION MATRICES					
	Classification: S1			Classification: S2		
Group	% Correct	No Beh.	Pos. Beh.	% Correct	No Beh.	Pos. Beh.
No Beh. B1	65,8	48	25	68,7	57	26
B2	64,8	59	32	72,4	76	29
Pos.Beh. B1	87,8	10	72	76,7	10	33
B2	91,8	6	67	80,0	6	24

Canonical Correlations			
S1B1: 0,642	S1B2: 0,633	S2B1: 0,438	S2B2: 0,549

effectively than T alone. This hypothesis was not confirmed, but the regular appearance of TC as a predictor in the discriminant analyses indicates that TC might be useful in some cases in helping to distinguish those who engage in overt behaviour from those who do not externalize their attitudes in behaviour. In the positive-neutral prediction exercise reported above, there were significant differences in most cases between the TC scores in the neutral and positive groups: positive individuals were more certain than neutral individuals. Differences of comparable magnitude were not found between the members of negative and neutral groups. It is possibly for this reason that Postulate 1 was not confirmed.

(iii) The T method is effective in predicting membership of the neutral

TABLE 46

Discriminant Analysis Results for Negative-Neutral Categories: Pub Sample

Scale	Criterion	Vars.Entered	Percentage Correctly Classified		Canonical Corr.
			Neg. Beh.	No Beh.	
TE	B1	TE MGE	78,3	70,4	0,434
TE	B2	TE MGE	68,4	65,2	0,327
LE	B1	LE MGE	82,6	67,3	0,414
LE	B2	LE WCM	68,4	69,8	0,373
SDE	B1	SDE MGE CWE	72,7	72,1	0,461
SDE	B2	SDE MGE	66,7	70,9	0,409
TI	B1	CI	75,0	69,9	0,413
TI	B2	CI	75,0	67,5	0,354
LI	B1	LI	66,7	76,3	0,418
LI	B2	CI	75,0	67,0	0,346
SDI	B1	CI	78,3	66,2	0,412
SDI	B2	CI SSDI	70,0	67,7	0,395
TR	B1	PCR WCC	70,0	73,6	0,409
TR	B2	TR SPMR	75,0	65,8	0,285
LR	B1	PCR WCC	70,0	73,9	0,408
LR	B2	CR SPMR	50,0	66,1	0,272
SDR	B1	PCR	71,4	62,7	0,367
SDR	B2	SDR	63,2	64,8	0,244

TABLE 47

Discriminant Analysis Results for Negative-Neutral-Positive Categories: Pub Sample

TABLE 49

Means and F-ratios of I Variables Included in the Negative-Neutral-Positive Prediction Exercise: Pub Sample

	PREDICTION OF B1				PREDICTION OF B2			
	Means			F-ratio	Means			F-ratio
	Neg.Beh. n=22	No Beh. n=80	Pos.Beh. n=51		Neg.Beh. n=29	No Beh. n=99	Pos.Beh. n=25	
TI	0,279	0,406	0,588	27,219	0,336	0,419	0,695	31,428
TCI	0,807	0,733	0,789	1,112	0,716	0,744	0,890	3,835
LI	0,262	0,471	0,668	35,201	0,362	0,486	0,755	25,578
SDI	0,163	0,440	0,725	39,265	0,286	0,466	0,855	31,142
PCI	0,201	0,356	0,433	14,713	0,241	0,364	0,480	13,445
PMI	0,315	0,430	0,531	17,510	0,351	0,453	0,537	9,889
CI	0,189	0,419	0,593	30,215	0,247	0,443	0,677	28,099
CWI	0,067	0,130	0,163	5,308	0,097	0,137	0,154	1,805
MGI	0,133	0,222	0,296	11,511	0,166	0,240	0,290	5,355
WCC	0,324	0,353	0,395	0,841	0,379	0,366	0,330	0,325
WCM	0,426	0,527	0,551	2,090	0,466	0,534	0,530	0,899
STI	1,032	1,170	1,188	0,919	1,111	1,175	1,134	0,234
SLI	0,893	1,061	1,064	0,991	1,060	1,072	0,877	1,442
SSDI	0,792	0,513	0,586	1,410	0,813	0,507	0,582	2,212

TABLE 50

Means and F-ratios of R Variables Included in the Negative-Neutral-Positive Prediction Exercise: Pub Sample

	PREDICTION OF B1				PREDICTION OF B2			
	Means			F-ratio	Means			F-ratio
	Neg.Beh. n=28	No Beh. n=81	Pos.Beh. n=43		Neg.Beh. n=19	No Beh. n=103	Pos.Beh. n=30	
TR	0,284	0,425	0,672	36,216	0,303	0,429	0,713	29,072
TCR	0,795	0,702	0,802	2,112	0,763	0,717	0,842	2,151
LR	0,342	0,438	0,720	33,547	0,332	0,455	0,761	28,894
SDR	0,308	0,464	0,725	23,432	0,276	0,471	0,786	25,145
PCR	0,283	0,425	0,529	20,556	0,329	0,420	0,519	7,654
PMR	0,494	0,535	0,641	7,419	0,465	0,538	0,683	11,547
CR	0,222	0,311	0,437	14,520	0,217	0,317	0,447	11,032
CWR	0,128	0,156	0,174	1,256	0,133	0,157	0,168	0,518
MGR	0,235	0,277	0,352	4,329	0,213	0,284	0,362	4,510
WCC	0,437	0,358	0,331	1,851	0,401	0,373	0,317	0,925
WCM	0,500	0,519	0,549	0,381	0,474	0,532	0,529	0,450
STR	0,684	0,912	0,830	2,560	0,695	0,882	0,821	1,340
SLR	0,634	0,728	0,449	5,052	0,653	0,662	0,514	1,138
SSDR	0,562	0,700	0,856	1,558	0,597	0,697	0,868	1,017

TABLE 51

Variables Entered, Percentage Correctly Classified and Canonical Correlations: All-Attitude Analysis, Pub Sample

Crit.	Subdomain	Vars Entered	Percentage Correctly Classified			Canonical Corrs.	
			Neg.Beh.	No Beh.	Pos.Beh.		
B1	E	TE LE	77,3	43,0	82,2	0,660	0,082
B2	E	TE LE	77,8	42,2	81,8	0,582	0,036
B1	I	SDI CI	81,8	31,3	74,5	0,613	0,079
B2	I	TI CI TCI	72,4	39,4	80,0	0,610	0,220
B1	R	TR SLAR TCR PCR	57,1	49,4	74,4	0,641	0,262
B2	R	TR TCR	52,6	39,8	76,7	0,567	0,094

10.4 Implications of the Findings for Hypothesis 2 and Postulate 2

In both samples, the main predictors - attitude, coworker pressure, management pressure and consequences - had highly significant initial F-ratios in almost all analyses. In no case, however, were all predictors selected. Generally, two or three predictors were sufficient to exhaust almost all the predictive power of the set. The reason for this appears to be that the predictors are quite highly intercorrelated.

Attitude emerged as the most powerful predictor. (Even in a set of analyses, not reported, which included behavioural intention as a predictor, attitude proved to be the most powerful predictor in most cases.) Only consequences was selected ahead of attitude in a few cases.

Hypothesis 2, therefore, received only qualified support.

In comparison with other attitude measurement methods, the T method performed well, on balance probably slightly better than the other methods. The difference is not great, however. Hence, there is only modest support for Postulate 2.

11.0 BLACK ADVANCEMENT DATA ANALYSIS III: EXAMINATION OF AFFECTIVE AND DISPOSITIONAL MODELS

In this chapter we shall report the findings on two sets of variables. The first includes only affective variables in an MTMM design. Hypotheses 3 and 4 were tested using the MTMM data. Affective, conative and cognitive variables are included in the second set. Data based on this set were used to test the second-order dispositional models posited in Hypothesis 5 and Postulate 3.

Only complete protocols were used for all confirmatory analyses reported in Chapters 11 and 12. The Priv sample consisted of 173 individuals and the Pub sample 157. The covariance matrices of all variables used in the confirmatory analyses performed in this study are presented in Appendices III and IV: the Priv matrix appears in Appendix III and the Pub matrix in Appendix IV. Kurtoses of variables used in the confirmatory analyses are given in Table 99.

11.1 Affective Models

Altogether, nine variables are included in this model, which is a (3x3) MTMM model. In the first series of analyses, we shall report the results of a confirmatory factor analysis technique in which method and trait factors were hypothesized to influence scores additively. This technique was applied to test Hypothesis 3. Programme RESFA was used. In the second set of analyses, Browne's (1983) multiplicative decomposition of covariance structures method was used to test Hypothesis 4. Programme MUTMUM was used. In both cases, analyses were performed on correlations derived from the covariances given in Appendix III and IV.

11.1.1 Confirmatory factor analysis

The Priv findings will be described first. The model produced a non-significant χ^2 overall goodness-of-fit statistic (χ^2 with 12 degrees of freedom was 10,12; p=0,606). With correction for kurtosis, the p value was 0,789. The model therefore appears to fit the data very well.

The Λ matrix is presented in Table 52. Matrices Φ and Ψ^2 are given in Tables 53 and 54 respectively.

TABLE 52

Matrix Λ of Factor Loadings for MTMM Confirmatory Factor Analysis Model: Priv Sample

Measures	FACTORS					
	Traits			Methods		
	E	I	R	T	L	SD
TE	0,702	0,0	0,0	0,555	0,0	0,0
TI	0,0	0,604	0,0	0,714	0,0	0,0
TR	0,0	0,0	0,782	0,479	0,0	0,0
LE	0,712	0,0	0,0	0,0	0,412	0,0
LI	0,0	0,625	0,0	0,0	0,705	0,0
LR	0,0	0,0	0,791	0,0	0,454	0,0
SDE	0,487	0,0	0,0	0,0	0,0	0,862
SDI	0,0	0,723	0,0	0,0	0,0	0,594
SDR	0,0	0,0	0,715	0,0	0,0	0,618

TABLE 53

Matrix Φ of Factor Intercorrelations for MTMM Factor Analysis Model: Priv Sample

Measures	FACTORS					
	Traits			Methods		
	E	I	R	T	L	SD
E	1,000					
I	0,829	1,000				
R	0,917	0,864	1,000			
T	0,0	0,0	0,0	1,000		
L	0,0	0,0	0,0	0,942	1,000	
SD	0,0	0,0	0,0	0,808	0,798	1,000

TABLE 54

Diagonal of Ψ^2 Matrix of Scale Uniquenesses for MTMM Factor Analysis Model: Priv Sample

	T Scale	L Scale	SD Scale
E	0,199	0,323	0,019
I	0,125	0,111	0,124
R	0,159	0,168	0,107

The findings based on the Pub sample will be presented below. The RESFA model achieved a good fit to the data (χ^2 with 12 degrees of freedom was 9,83; p=0,631). The incorporation of the correction for kurtosis resulted in a goodness-of-fit statistic of 8,95 (p=0,707).

Tables 55, 56 and 57 present the relevant matrices.

TABLE 55

Matrix Λ of factor Loadings for MTMM Confirmatory Factor Analysis Model: Pub Sample

	FACTORS					
Measures	Traits			Methods		
	E	I	R	T	L	SD
TE	0,853	0,0	0,0	0,346	0,0	0,0
TI	0,0	0,675	0,0	0,493	0,0	0,0
TR	0,0	0,0	0,736	0,550	0,0	0,0
LE	0,795	0,0	0,0	0,0	0,308	0,0
LI	0,0	0,656	0,0	0,0	0,755	0,0
LR	0,0	0,0	0,810	0,0	0,448	0,0
SDE	0,599	0,0	0,0	0,0	0,0	0,699
SDI	0,0	0,747	0,0	0,0	0,0	0,510
SDR	0,0	0,0	0,733	0,0	0,0	0,568

TABLE 62

Method Intercorrelations based on the Multiplicative Model: Pub Sample

	T	L	SD
T	1,000		
L	0,964	1,000	
SD	0,923	0,893	1,000

TABLE 63

Reliability Indices, ρ_h, of Variables: Pub Sample

	T Scale	L Scale	SD Scale
E	0,896	0,841	0,878
I	0,836	0,932	0,899
R	0,912	0,921	0,945

11.1.3 General comments on the MTMM findings

In both samples, all factor loadings in the RESFA analyses are highly significant. Loadings on trait factors are mostly in the 0,6 to 0,8 range, therefore substantial. Method loadings, however, are also quite substantial, ranging from about 0,3 to about 0,8. Hence, although all scales appear to be measuring their underlying dimension effectively, scores are quite markedly coloured by method variance. Inspection of the uniquenesses of the variables indicates these to be acceptably low with no particular methodology emerging as clearly superior on this score.

Both the RESFA and MUTMUM analyses showed the E, I and R subdomains to be highly intercorrelated (the estimates of the intercorrelations are highly significant, hence precise). In both samples and both models, these intercorrelations are in the range 0,86 to 0,95. In a set of RESFA analyses (not reported here) in which a one-trait model was imposed, very poor fits were obtained. Therefore, the E, I and R subdomains appear to be highly related but nevertheless distinct.

In both samples and under both models, methods also appeared to be highly intercorrelated (again, estimates were very significant and hence precise). There is evidence that the T and L methods are more closely related to each other than to the SD method.

Hypotheses 3 and 4 both received support, but Hypothesis 3 was more strongly supported than Hypothesis 4. Although the additive model seems to fit the data better than the multiplicative model, the corresponding estimates of correlations produced under both models are highly comparable. This increases confidence in these estimates.

A number of criteria of performance of the methods can be derived from the analyses reported in this section, including trait and method loadings, uniquenesses, reliability estimates and residuals. None of these indicate that any of the methods is clearly superior. The three methods appear to be quite evenly matched on the above criteria and all performed creditably.

11.2 Dispositional Models

In the models to be examined in this section, affective, conative and cognitive variables were included in second-order structures. Hypothesis 5 involved the testing for goodness-of-fit of a second-order dispositional model incorporating a single disposition. It was necessary, therefore, to apply the model six times: to E, I and R data in the Priv and Pub samples. In Postulate 3 the adequacy of a model incorporating three dispositional structures was examined. Two applications of this model were required: one for each sample. We shall call the smaller model the single-disposition model and the larger one the multiple-disposition model.

Up to this point, the analyses we have reported have been based on correlation matrices. The goodness-of-fit of a factor analysis model is invariant under changes of scale: hence the fit of a model is identical whether a correlation or a covariance matrix is used as the basis of the analysis. Where possible, it is convenient to report results based on correlation matrices, as parameter estimates are easier to compare and evaluate.

In causal models, however, x and y variables (i.e., measures of exogenous and endogenous factors) should not both be standardized, as this distorts the regression coefficients. It is therefore usual to employ covariance matrices in the analysis of causal models. As the single-disposition model is a submodel of one of the causal models examined in this study, it was decided to perform all analyses from this stage onwards on covariance matrices. This allows certain comparisons between analyses to be made more easily.

In the present study, the variances of measures differ widely. Affect measures, which are composed of several items, have larger variances than measures of other constructs which consist of a single item. The SD scales, which are composed of items with seven response alternatives, have particularly large variances. The variances of measures used in the dispositional models are listed in Tables 72 and 81 in this chapter. As the variances of manifest variables influence the size of parameter estimates, it is more important when evaluating a parameter value to pay attention to its level of significance rather than its absolute size. For this reason, all tables of parameter estimates will include standard errors from this point onwards.

The χ^2 overall goodness-of-fit statistic of a hypothesized model is influenced by sample size. All other factors being constant, it is more difficult to confirm a model in a large sample than in a small one. The goodness-of-fit test is therefore slightly stricter in the Priv data than in the Pub data as the Priv sample is slightly larger (173 vs. 157). Jöreskog and Sorbom (1981) offer two alternative statistics which are not dependent on sample size and can be used to assess overall goodness-of-fit. These are the goodness-of-fit index (GFI) and the root mean square residual (RMR). The GFI index is expressed:

$$GFI = 1 - \frac{tr(\hat{\Sigma}^{-1}S-I)^2}{tr(\hat{\Sigma}^{-1}S)^2}$$

where

$\hat{\Sigma}$ is the fitted matrix, and

S is the observed covariance matrix.

The GFI index adjusted for degrees of freedom, AGFI, is expressed:

$$AGFI = 1 - \left[\frac{k(k+1)}{2d} \right] (1-GFI)$$

where

k is the number of manifest variables, and
d is the degrees of freedom for the model.

The RMR index is defined:

$$RMR = \sqrt{\frac{2\sum_{i=1}^{k} \sum_{j=1}^{i} (s_{ij} - \hat{\sigma}_{ij})^2}{k(k+1)}}$$

where

k is the total number of manifest variables in the model,
s_{ij} is the observed covariance between variables i and j, and
$\hat{\sigma}_{ij}$ is the estimated covariance between variables i and j in the fitted model.

GFI and AGFI are measures of the relative amount of covariance accounted for by the model. For all practical purposes, these indices vary between zero and unity, although it is theoretically possible for them to be negative. Unfortunately, the distributions of GFI and AGFI are unknown; hence there is no standard to which they can be compared.

RMR is an index of the average residual covariance. It can be interpreted only in relation to the observed covariances; it is useful when comparing the fit of two different models on the same data. GFI can be used for this purpose also, but in addition can give an indication of the goodness-of-fit models on different data.

It will be remembered from Chapter 7 that structural equation models actually consist of two submodels: one measurement and one structural. It is good practice to examine the measurement submodel first and implement any changes necessitated by measurement problems before evaluating the structural submodel. Only changes which can be justified on theoretical or logical grounds should be effected.

In the models currently under discussion, improvement in the quality of fit could be achieved in some cases by allowing certain observed variable uniquenesses to covary. When one remembers that conative and cognitive constructs were measured by a set of items and not by a number of separate scales, the justifiability can be seen of allowing the uniquenesses of items measuring the same construct or of items sharing the same format to covary in some cases.

The greatest circumspection was exercised in this regard. The matrix of modification indices was used to identify those parameters which, if freed would improve the goodness-of-fit substantially (see Chapter 7 for a description of the modification index). Almost all high modification values were found in the measurement submodel and were generally for parameters representing covariances of uniquenesses of items similar in format or content. In the applications of the single-disposition model, very few high modification indices were found: generally only one and sometimes none. The incidence of high modification indices was somewhat higher in the multiple-disposition model.

Because of the large volume of data processing done on the models, only "final" results will be presented. Intermediate analyses which were used to decide on modifications to the models will not be reported, although many of these were done, especially on the models reported in the next chapter. Only two types of modification were undertaken: allowing uniquenesses of related manifest variables to covary; and constraining uniquenesses of latent variables to be zero. The first generally improves the fit, and the second makes the fit poorer. It was necessary to perform the latter modification in cases where estimated uniquenesses were negative. In almost all instances, these were only marginally negative. As negative covariances make no sense statistically or psychologically, there is no alternative but to constrain these to be zero. This type of modification is "safe" in that it does not result in a model which fits better than it really should: the fit is always worse, although usually only marginally worse.

All modifications which were made to the models for each application will be stated explicitly.

11.2.1 Single-disposition model

In Hypothesis 5, the following covariance structure is posited:

$$\Sigma = \Lambda(\Gamma\Gamma' + \Psi)\Lambda' + \Theta_{\varepsilon}^{2} ,$$

where

- Σ is the (10x10) covariance matrix of three affective, three conative and four cognitive variables,
- Λ is a (10x3) matrix of affective, conative and cognitive factor loadings,
- Γ is a (3x1) matrix of regression coefficients of the affective, conative and cognitive factors on the disposition factor,
- Ψ is a (3x3) diagonal matrix of factor uniquenesses, and
- Θ_{ε}^{2} is a (10x10) matrix of observed variable uniquenesses.

In the LISREL V computer programme which was used for all second-order and causal models investigated in this study, the matrix B is redefined as follows:

$$B_{new} = I - B_{old}$$

where

- B_{new} is the B matrix used in LISREL V, and
- B_{old} is the matrix referred to in the discussion of structural equation models in Section 7.5.

From this point onwards, we shall use the symbol B to refer to the matrix B_{new}.

In the single-disposition model, there are no structural links between first-order factors; hence $B=[0]$, and the matrix of structural equations amongst latent variables may be written:

$$\eta = \Gamma\xi_1 + \zeta$$

where

η is a (3x1) matrix of first-order factors,

ξ_1 is a single variable representing the second-order factor, and

ζ is a (3x1) matrix of factor uniquenesses.

The model is illustrated in Figure 23.

In accordance with our usual practice, we shall report the Priv results first.

The following extra specifications were made for the E, I and R applications of the single-disposition model.

E (1) The uniqueness of the cognitive factor was constrained to zero.

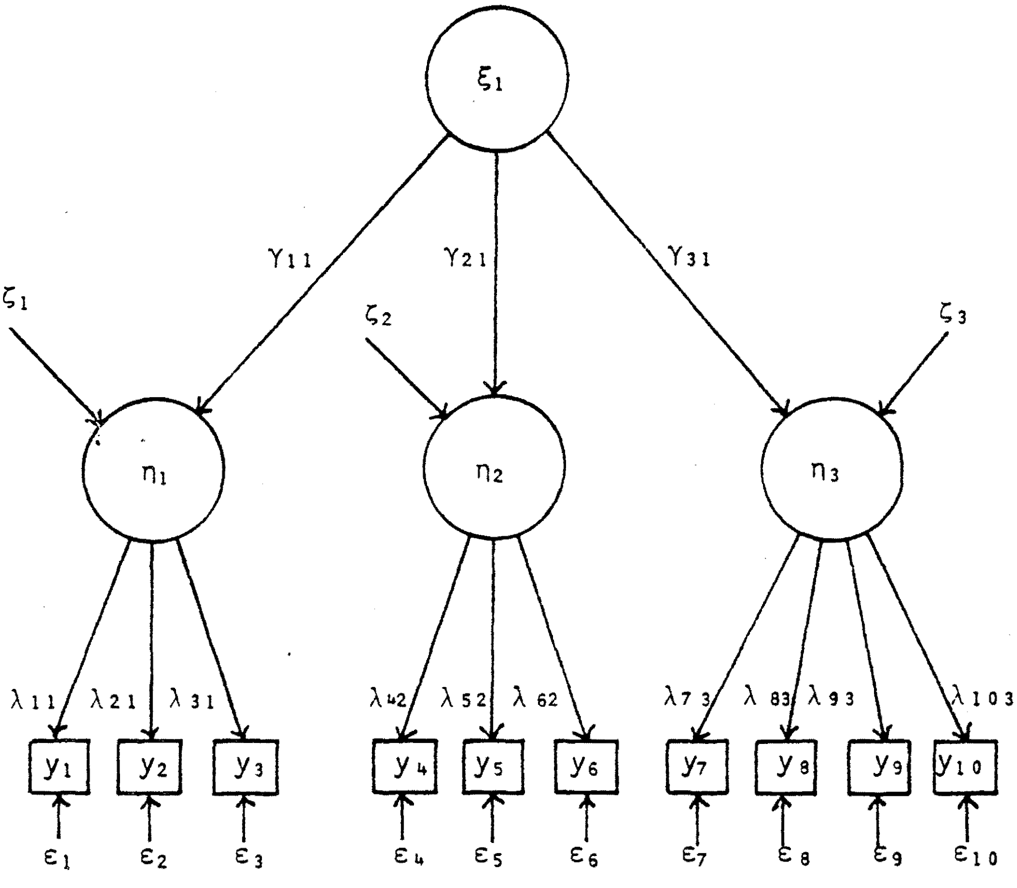
(2) The uniqueness of CE2 was allowed to covary with the uniqueness of CE4.

I No extra specifications.

R (1) The uniqueness of the cognitive factor was constrained to be zero.

(2) The uniqueness of CR1 was allowed to covary with the uniqueness of CR3.

Table 64 presents the following information on the E, I and R applications of the model on the Priv data: χ^2 value, degrees of freedom, probability levels, GFI indices, AGFI indices and RMR indices.



KEY

(1) η_1 is affect (a).

(2) η_2 is behavioural intention (b).

(3) η_3 is cognition (c).

(4) y_1, y_2, y_3 are T, L, SD respectively.

(5) y_4, y_5, y_6 are BI1, BI2, BI3 respectively.

(6) y_7, y_8, y_9, y_{10} are C1, C2, C3, C4 respectively.

Figure 23. Single-Disposition Model

TABLE 64

Goodness-of-Fit Statistics of the Single-Disposition Model: Priv Sample

	E	I	R
χ^2	51,85	47,52	105,29
d.f.	32	32	32
p level	0,015	0,038	0,000
GFI index	0,848	0,904	0,753
AGFI index	0,739	0,835	0,576
RMR index	0,273	0,275	0,238

In the E and I applications, the χ^2 statistic reveals that the model fits indifferently; nevertheless, the GFI and AGFI indices appear to be quite high. On the R data, the model fits poorly.

Tables 65 to 67 list the factor loadings and standard errors of the E, I and R applications. We shall refer to the affective, conative (behavioural intention) and cognitive factors as the a, b and c factors respectively.

TABLE 65

Matrix Λ of Factor Loadings, Single-Disposition Model. Standard Errors in Brackets. E Subdomain: Priv Sample

	FACTORS		
Measures	a	b	c
TE	1,000 (0,0)	0,0	0,0
LE	0,773 (0,060)	0,0	0,0
SDE	1,517 (0,114)	0,0	0,0
BIE1	0,0	1,000 (0,0)	0,0
BIE2	0,0	1,460 (0,139)	0,0
BIE3	0,0	1,007 (0,141)	0,0
CE1	0,0	0,0	1,000 (0,0)
CE2	0,0	0,0	1,990 (0,680)
CE3	0,0	0,0	3,203 (0,978)
CE4	0,0	0,0	0,704 (0,360)

TABLE 66

Matrix Λ of Factor Loadings, Single-Disposition Model. Standard Errors in Brackets. I Subdomain: Priv Sample

	FACTORS		
Measures	a	b	c
TI	1,000 (0,0)	0,0	0,0
LI	0,951 (0,049)	0,0	0,0
SDI	1,788 (0,103)	0,0	0,0
BII1	0,0	1,000 (0,0)	0,0
BII2	0,0	0,814 (0,094)	0,0
BII3	0,0	0,753 (0,071)	0,0
CI1	0,0	0,0	1,000 (0,0)
CI2	0,0	0,0	2,794 (0,795)
CI3	0,0	0,0	2,370 (0,697)
CI4	0,0	0,0	1,811 (0,546)

TABLE 67

Matrix Λ of Factor Loadings, Single-Disposition Model. Standard Errors in Brackets. R Subdomain: Priv Sample

	FACTORS		
Measures	a	b	c
TR	1,000 (0,0)	0,0	0,0
LR	0,897 (0,049)	0,0	0,0
SDR	1,701 (0,090)	0,0	0,0
BIR1	0,0	1,000 (0,0)	0,0
BIR2	0,0	0,799 (0,079)	0,0
BIR3	0,0	1,344 (0,100)	0,0
CR1	0,0	0,0	1,000 (0,0)
CR2	0,0	0,0	2,279 (0,477)
CR3	0,0	0,0	1,078 (0,233)
CR4	0,0	0,0	2,140 (0,433)

It will be noticed from Tables 65 to 67 that the first non-zero entry in each factor column is set to unity. The LISREL model requires that this be done with the measures of η variables in order to fix a scale. (With the measures of ξ variables, two courses of action are open: to set one loading on each ξ factor to unity, or to set the diagonal elements of Φ to unity, thus converting Φ to a matrix of ξ factor intercorrelations rather than covariances. The latter course was adopted for all models which have Φ matrices.)

The Γ parameter estimates for all three subdomains are presented in Table 68. As a reference, the Γ estimates from a standardized solution in which the variances of η parameters were set to unity are given in Table 69.

TABLE 68

Γ Matrices of Regressions of First-Order Factors on Disposition. Standard Errors in Brackets. Unstandardized Solution: Priv Sample

Factor	E	I	R
a	3,296 (0,261)	3,328 (0,242)	3,719 (0,253)
b	0,652 (0,065)	1,026 (0,091)	0,864 (0,078)
c	0,489 (0,146)	0,541 (0,154)	0,632 (0,123)

TABLE 69

Γ Matrices of Regressions of First-Order Factors on Disposition. Standardized Solution: Priv Sample

Factor	E	I	R
a	0,947	0,948	0,989
b	0,963	0,995	0,947
c	1,000	0,973	1,000

NOTE Regressions of unity result when factor uniquenesses are set to zero.

The factor uniquenesses are listed in Table 70.

TABLE 70

Ψ Matrices of Factor Uniqueness. Standard Errors in Brackets. Priv Sample

Factor	E	I	R
a	1,240 (0,701)	1,261 (0,486)	0,297 (0,484)
b	0,033 (0,031)	0,011 (0,056)	0,086 (0,036)
c	0,0	0,016 (0,021)	0,0

Table 71 displays the diagonal elements of matrix Θ_ε. These are the uniquenesses of the manifest measures. The variances of these measures are given in Table 72 for reference purposes.

TABLE 71

Diagonal Elements of Θ_ε Matrices, Single-Disposition Model. Standard Errors in Brackets. Priv Sample

Measures	E	I	R
T	3,449 (0,595)	2,594 (0,399)	2,993 (0,441)
L	4,065 (0,539)	2,097 (0,339)	2,901 (0,402)
SD	14,461 (1,957)	11,731 (1,598)	9,066 (1,314)
BI1	0,394 (0,051)	0,777 (0,100)	0,544 (0,067)
BI2	0,383 (0,068)	0,950 (0,111)	0,468 (0,055)
BI3	0,948 (0,109)	0,377 (0,051)	0,259 (0,055)
C1	3,171 (0,345)	3,684 (0,401)	2,261 (0,247)
C2	4,278 (0,474)	1,216 (0,195)	2,948 (0,334)
C3	2,281 (0,286)	2,446 (0,291)	2,261 (0,247)
C4	3,139 (0,340)	2,115 (0,243)	1,758 (0,204)

TABLE 72

Variances of Measures, Single-Disposition Model: Priv Sample

Measures	E	I	R
T	15,555	14,933	17,118
L	11,300	13,255	14,267
SD	42,318	51,196	49,941
BI1	0,852	1,841	1,376
BI2	1,359	1,656	0,999
BI3	1,412	0,980	1,762
C1	3,410	3,993	2,661
C2	5,223	3,629	5,025
C3	4,730	4,181	2,726
C4	3,258	3,129	3,588

The Pub results will be displayed in exactly the same fashion as the Priv results.

The following extra specifications were made for the E, I and R applications of the model.

E (1) The uniquenesses of the conative and cognitive factors were constrained to zero.

(2) The uniqueness of CE1 was allowed to covary with the uniqueness of CE3.

I (1) The uniqueness of the affective factor was constrained to be zero.

(2) The uniqueness of CI1 was permitted to covary with the uniqueness of CI3.

R (1) The uniquenesses of the affective and cognitive factors were constrained to be zero.

Tables 73 to 81 display the results for the Pub data.

TABLE 73

Goodness-of-Fit Statistics of the Single-Disposition Model: Pub Sample

	E	I	R
χ^2	25,61	46,61	42,63
d.f.	33	32	34
p level	0,817	0,046	0,147
GFI index	0,891	0,890	0,890
AGFI index	0,819	0,812	0,821
RMR index	0,265	0,193	0,182

TABLE 74

Matrix Λ of Factor Loadings, Single-Disposition Model. Standard Errors in Brackets. E Subdomain: Pub Sample

	FACTORS		
Measures	a	b	c
TE	1,000 (0,0)	0,0	0,0
LE	0,831 (0,059)	0,0	0,0
SDE	1,584 (0,126)	0,0	0,0
BIE1	0,0	1,000 (0,0)	0,0
BIE2	0,0	1,352 (0,128)	0,0
BIE3	0,0	1,220 (0,122)	0,0
CE1	0,0	0,0	1,000 (0,0)
CE2	0,0	0,0	2,634 (0,948)
CE3	0,0	0,0	2,581 (0,830)
CE4	0,0	0,0	0,730 (0,379)

TABLE 75

Matrix Λ of Factor Loadings, Single-Disposition Model. Standard Errors in Brackets. I Subdomain: Pub Sample

	FACTORS		
Measures	a	b	c
TI	1,000 (0,0)	0,0	0,0
LI	1,257 (0,087)	0,0	0,0
SDI	2,337 (0,183)	0,0	0,0
BII1	0,0	1,000 (0,0)	0,0
BII2	0,0	0,728 (0,109)	0,0
BII3	0,0	0,789 (0,102)	0,0
CI1	0,0	0,0	1,000 (0,0)
CI2	0,0	0,0	1,810 (0,307)
CI3	0,0	0,0	1,208 (0,192)
CI4	0,0	0,0	1,658 (0,288)

TABLE 76

Matrix Λ of Factor Loadings, Single-Disposition Model. Standard Errors in Brackets. R Subdomain: Pub Sample

	FACTORS		
Measures	a	b	c
TR	1,000 (0,0)	0,0	0,0
LR	1,033 (0,063)	0,0	0,0
SDR	1,844 (0,110)	0,0	0,0
BIR1	0,0	1,000 (0,0)	0,0
BIR2	0,0	0,728 (0,069)	0,0
BIR3	0,0	1,000 (0,076)	0,0
CR1	0,0	0,0	1,000 (0,0)
CR2	0,0	0,0	1,511 (0,351)
CR3	0,0	0,0	0,862 (0,224)
CR4	0,0	0,0	1,984 (0,386)

TABLE 77

Γ Matrices of Regressions of First-Order Factors on Disposition. Standard Errors in Brackets. Unstandardized Solution: Pub Sample

Factor	E	I	R
a	3,140 (0,252)	2,776 (0,223)	3,499 (0,243)
b	0,838 (0,075)	0,963 (0,103)	1,095 (0,088)
c	0,469 (0,159)	0,838 (0,140)	0,633 (0,115)

TABLE 78

Γ Matrices of Regressions of First-Order Factors on Disposition. Standardized Solution: Pub Sample

Factor	E	I	R
a	0,925	1,000	1,000
b	1,000	0,971	0,962
c	1,000	0,945	1,000

TABLE 79

Ψ Matrices of Factor Uniquenesses. Standard Errors in Brackets. Pub Sample

Factor	E	I	R
a	1,663 (0,574)	0,0	0,0
b	0,0	0,056 (0,075)	0,098 (0,050)
c	0,0	0,084 (0,054)	0,0

TABLE 80

Diagonal elements of Θ_ε Matrices, Single-Disposition Model. Pub Sample

Measures	E	I	R
T	2,565 (0,505)	3,564 (0,481)	2,794 (0,432)
L	3,373 (0,492)	2,323 (0,432)	3,809 (0,545)
SD	17,737 (2,367)	17,049 (2,368)	11,334 (1,654)
BI1	0,463 (0,063)	1,057 (0,143)	0,481 (0,072)
BI2	0,675 (0,097)	1,039 (0,127)	0,620 (0,077)
BI3	0,725 (0,098)	0,735 (0,097)	0,535 (0,078)
C1	3,453 (0,394)	2,530 (0,299)	1,747 (0,201)
C2	3,609 (0,429)	1,738 (0,257)	3,271 (0,377)
C3	2,407 (0,292)	2,215 (0,270)	1,658 (0,190)
C4	2,583 (0,294)	1,880 (0,257)	1,893 (0,226)

TABLE 81

Variances of Measures, Single-Disposition Model: Pub Sample

Measures	E	I	R
T	14,087	11,268	15,036
L	11,322	14,489	16,866
SD	46,635	59,122	52,980
BI1	1,165	2,041	1,777
BI2	1,958	1,561	1,307
BI3	1,771	1,348	1,832
C1	3,673	3,316	2,147
C2	5,135	4,313	4,185
C3	3,872	3,362	1,955
C4	2,700	4,041	3,469

11.2.2 General comments on the single-disposition model

It appears that the second-order disposition model accounts for the data quite well in the Pub sample, but not in the Priv. In the Pub sample, the model proved to be a good fit in two subdomains, E and R and a marginal one in the third. Inspection of the residuals, modification indices and first-order derivatives of the I analysis indicated that the indifference of the fit was largely due to measurement rather than structural problems. By relaxing one more constraint (allowing the uniqueness of BII1 to correlate with the uniqueness of BII2), the χ^2 value drops to 40,19 with 31 degrees of freedom. This corresponds to a probability level in excess of 0,10. Hence, the structural submodel appears to fit the Pub data well in all subdomains.

In order to investigate the failure of the model to fit the Priv data adequately, the residual matrices of the three model-fitting exercises in this sample were inspected. LISREL prints out normalized residuals: this makes it possible to compare residuals with the effects of differential covariances controlled. Table 82 lists the residuals which were in excess of 0,8 in the three subdomains.

TABLE 82

Normalized Residuals in Excess of 0,8 in the Single-Disposition Model: Priv Sample

E	I	R
LExCE1	TIxCI4	LRxCR2
BIE2xCE1	SDIxCI4	BIR1xCR1
BIE3xCE4	SDIxCI3	BIR2xCR3
BIE1xCE3	BII2xCI4	BIR2xCR4
BIE3xCE3	CI1xCI3	BIR3xCR3
CE1xCE4		CR1xCR2
CE2xCE4		CR2xCR3

In all three subdomains, all residuals in excess of 0,8 involve cognitive variables. Conative covariates are also quite heavily represented in the E and R residuals. It seems, then, that the cognitive, and to a lesser extent, the conative constructs have less integrity in the Priv sample than in the Pub. It might be unrealistic to try to model cognitive evaluations of the Black advancement issues in a single factor. Beliefs are to a large extent imposed on the individual by events in his environment and by the opinions of others. If the individual is exposed to a diverse array of cognitive material, it becomes virtually impossible for him to reduce this to a single cognitive dimension without distorting the "facts" in quite a radical manner.

In the Priv organization, Black advancement programmes had been introduced on quite an extensive scale. It is likely that diverse outcomes of these programmes had generated a complex set of beliefs in Priv individuals which could not be accommodated in a single cognitive factor. The cognitions of Pub subjects might have been simpler because these individuals had been exposed to fewer real-life events relating to Black advancement: it was therefore easier for Pub individuals to form an overall cognitive impression.

Inspection of the matrices of variable uniquenesses gives further information which seems to support some of the above speculations. In both samples, the affect measures have the lowest proportion of unique and error variance and the cognitive variables the highest. To some extent, the small proportion of error and unique variance in the affect measures is due to the fact that each affect variable is composed of several items and is therefore freer of measurement error than one-item cognitive and conative measures. Possibly a more important reason for the small proportion of uniqueness in the affect variables is that affect is a "simple" construct in comparison with cognition and conation. The scales formed by adding together the scores of the four cognitive items of each subdomain have low internal consistencies as estimated by coefficient alpha. This is further evidence of the multidimensionality of the cognitive construct.

Although the dispositional structure proved to fit the data quite well in the Pub sample, the amount of unique variance in the cognitive measures is comparable with that found in the Priv sample. It seems then that a cognitively more elaborated dispositional model would have been preferable in both samples. More cognitive variance might have been incorporated in the latent variables by such a model.

The overall conclusion is that Hypothesis 5 received only circumscribed support.

11.2.3 Multiple-disposition model

In Postulate 3, the following covariance structure is posited:

$$\Sigma = \Lambda(\Gamma\Phi\Gamma' + \Psi)\Lambda' + \Theta_\varepsilon^2 ,$$

where

- Σ is the (30x30) covariance matrix of affective, conative and cognitive variables in all three subdomains,
- Λ is a (30x14) matrix of trait and method loadings,
- Γ is a (14x8) matrix of regression coefficients,
- Φ is an (8x8) matrix of second-order disposition factor intercorrelations and method factor intercorrelations,
- Ψ is a (14x14) matrix of zeros except for 9 first-order trait factor uniquenesses in the diagonal, and
- Θ_ε^2 is a (30x30) diagonal matrix of observed variable uniquenesses.

The matrix Λ can be partitioned into a (30x9) submatrix of trait factor loadings and a (30x5) submatrix of method factor loadings. The trait factors are a, b and c factors in the E, I and R subdomains. There is one method factor for each affect measurement method and one each for the conative and cognitive measurement methods (five altogether).

In order to constitute the matrices correctly, it was necessary to create five dummy η method factors which were constrained to correlate perfectly with their respective ξ counterparts. In this way, the method factor loadings could be accommodated in the Λ matrix (which in the terminology of Section 7.5 is actually a Λ_y matrix and hence a matrix of endogenous, or η, factor loadings). Because the η factors were constrained to covary perfectly with their ξ counterparts, Γ contains a submatrix which is I(5x5).

The model may be appreciated more clearly on examining Figure 24 which is a diagrammatic representation of the model.

The structural relationships amongst latent variables may be expressed in matrix form as follows:

$$\eta = \Gamma\xi + \zeta ,$$

where

- η is a (14x1) matrix of first-order trait factors and dummy η method factors,
- Γ is as before,
- ξ is an (8x1) matrix of disposition factors and ξ method factors, and
- ζ is a (14x1) matrix of factor uniquenesses.

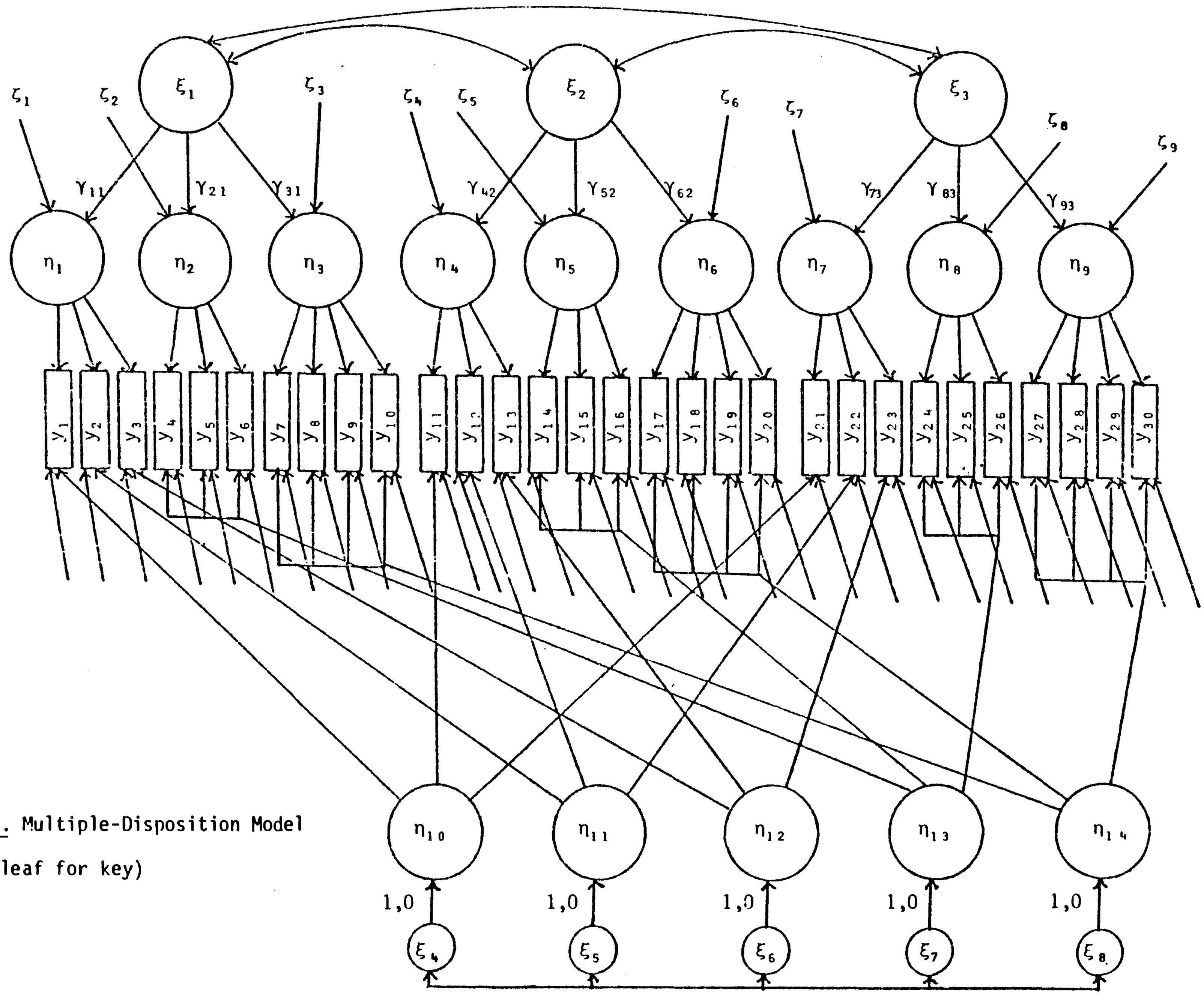


Figure 24. Multiple-Disposition Model

(See overleaf for key)

Key to Figure 24

(1) ξ_1, ξ_2, ξ_3 are E, I, R dispositions respectively.

(2) η_1, η_4, η_7 are a_E, a_I, a_R affect factors respectively.

(3) η_2, η_5, η_8 are b_E, b_I, b_R behavioural intention (conative) factors respectively.

(4) η_3, η_6, η_9 are c_E, c_I, c_R cognitive factors respectively.

(5) ξ_4, ξ_5, ξ_6, ξ_7, ξ_8 are T, L, SD, conative and cognitive method factors respectively.

(6) η_{10}, η_{11}, η_{12}, η_{13}, η_{14} are dummy endogenous method factors predicted perfectly by their respective exogenous method factors.

(7) y_1, y_2, y_3 are TE, LE, SDE respectively.

(8) y_4, y_5, y_6 are BIE1, BIE2, BIE3 respectively.

(9) y_7, y_8, y_9, y_{10} are CE1, CE2, CE3, CE4 respectively.

(10) y_{11}, y_{12}, y_{13} are TI, LI, SDI respectively.

(11) y_{14}, y_{15}, y_{16} are BII1, BII2, BII3 respectively.

(12) y_{17}, y_{18}, y_{19}, y_{20} are CI1, CI2, CI3, CI4 respectively.

(13) y_{21}, y_{22}, y_{23} are TR, LR, SDR respectively.

(14) y_{24}, y_{25}, y_{26} are BIR1, BIR2, BIR3 respecitvely.

(15) y_{27}, y_{28}, y_{29}, y_{30} are CR1, CR2, CR3, CR4 respectively.

NOTE

(a) The γ parameters have double subscripts (γ_{ij} is the regression of η_i and ξ_j). All other parameters shown have single subscripts, even if two digits are involved.

(b) The λ parameters are not labelled to avoid overcrowding.

(c) The unlabelled arrows converging on the y_i represent the measurement uniquenesses ε_i.

(d) In order to avoid unduly cluttering the diagramme, links joining cognitive and conative method factors with observed variables have been fused.

In expanded form:

$$\begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \\ \eta_5 \\ \eta_6 \\ \eta_7 \\ \eta_8 \\ \eta_9 \\ \eta_{10} \\ \eta_{11} \\ \eta_{12} \\ \eta_{13} \\ \eta_{14} \end{bmatrix} = \begin{bmatrix} \gamma_{11} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \gamma_{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \gamma_{31} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \gamma_{42} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \gamma_{52} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \gamma_{62} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \gamma_{73} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \gamma_{83} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \gamma_{93} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1,0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1,0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1,0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1,0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1,0 \end{bmatrix} \cdot \begin{bmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \\ \xi_4 \\ \xi_5 \\ \xi_6 \\ \xi_7 \\ \xi_8 \end{bmatrix} + \begin{bmatrix} \zeta_1 \\ \zeta_2 \\ \zeta_3 \\ \zeta_4 \\ \zeta_5 \\ \zeta_6 \\ \zeta_7 \\ \zeta_8 \\ \zeta_9 \\ \zeta_{10} \\ \zeta_{11} \\ \zeta_{12} \\ \zeta_{13} \\ \zeta_{14} \end{bmatrix}$$

The Λ matrix can be partitioned:

$$\Lambda = [\Lambda_T \Lambda_M]$$

where

Λ_T is a (30x9) submatrix of trait loadings, and

Λ_M is a (30x5) submatrix of method loadings.

Also, the η matrix can be partitioned:

$$\eta = \begin{bmatrix} \eta_T \\ \eta_M \end{bmatrix}$$

where

η_T is a (9x1) submatrix of trait factors, and
η_M is a (5x1) submatrix of method factors.

The structural relationships amongst the manifest and latent variables are expressed in matrix form:

$$y = [\Lambda_T \Lambda_M] \begin{bmatrix} \eta_T \\ \eta_M \end{bmatrix} + \varepsilon$$

where

y is the (30x1) matrix of manifest variables, and
ε is a (30x1) matrix of manifest variable uniquenesses.

The following notation is adapted to designate the factors. Each first-order trait factor is labelled by a symbol which indicates whether it is affective, conative or cognitive and by a subscript which indicates the subdomain. The symbols a, b and c are used for affective, conative (behavioural intention) and cognitive factors respectively. Hence, c_R indicates the cognitive factor of the R subdomain. The method factors for the T, L, SD, BI and C measurement techniques are designated t, l, sd, bi and k, respectively.

As is our general practice, we shall report the Priv results first.

The following modifications were made to the model:

(1) The uniquenesses of b_E, c_E, b_I and c_R were constrained to be zero to prevent them from becoming negative.

(2) The uniquenesses of SDR and BIE1 were constrained to be zero for the same reason.

Altogether 101 parameters had to be estimated by LISREL. This left 364 degrees of freedom (there are 465 distinct elements in Σ). A χ^2 value of 791,55 was obtained. The associated probability value is less than 0,001. Hence, the model is a very poor fit. This is not surprising for two reasons. Firstly, large models are more difficult to fit than small ones; the model currently under discussion is a very large model. Secondly, the single-disposition model proved to be a poor fit in all three subdomains in the Priv data; hence the multiple-disposition model would be expected to fit poorly also.

The GFI and AGFI also indicated that the fit was poor: these were 0,566 and 0,446 respectively.

As the Λ, Γ and Φ matrices are very large and mostly composed of zeros, only the non-zero parts of the matrices will be reproduced.

The factor loadings on the trait factors are listed in Table 83.

TABLE 83

Loadings on the Dispositional Factors, Multiple-Disposition Model.
Standard Errors in Brackets. Priv Sample

		SUBDOMAIN		
Measures	Factor Type	E	I	R
T	a	1,000 (0,0)	1,000 (0,0)	1,000 (0,0)
L	a	0,745 (0,058)	0,951 (0,048)	0,895 (0,048)
SD	a	1,670 (0,110)	1,865 (0,107)	1,780 (0,093)
BI1	b	1,000 (0,0)	1,000 (0,0)	1,000 (0,0)
BI2	b	1,537 (0,191)	0,813 (0,097)	0,780 (0,077)
BI3	b	1,137 (0,189)	0,778 (0,072)	1,325 (0,098)
C1	c	1,000 (0,0)	1,000 (0,0)	1,000 (0,0)
C2	c	2,735 (1,152)	2,752 (0,756)	1,819 (0,377)
C3	c	3,834 (1,416)	2,363 (0,642)	1,089 (0,193)
C4	c	1,390 (0,700)	1,748 (0,512)	1,849 (0,327)

Loadings on the method factors are shown in Table 84.

TABLE 84

Loadings on the Method Factors, Multiple-Disposition Model. Standard Errors in Brackets. Priv Sample

Measure	Factor	Loading
TE	t	1,000 (0,0)
TI	t	1,052 (0,206)
TR	t	0,915 (0,221)
LE	l	1,000 (0,0)
LI	l	0,927 (0,176)
LR	l	1,060 (0,199)
SDE	sd	1,000 (0,0)
SDI	sd	0,689 (0,329)
SDR	sd	2,480 (0,228)
BIE1	bi	1,000 (0,0)
BIE2	bi	0,322 (0,058)
BIE3	bi	0,141 (0,077)
BII1	bi	0,288 (0,073)
BII2	bi	0,332 (0,077)
BII3	bi	0,399 (0,046)
BIR1	bi	0,235 (0,062)
BIR2	bi	0,491 (0,051)
BIR3	bi	0,133 (0,058)
CE1	k	1,000 (0,0)
CE2	k	-0,518 (0,179)
CE3	k	0,437 (0,142)
CE4	k	-0,840 (0,145)
CI1	k	-0,618 (0,166)
CI2	k	0,092 (0,110)
CI3	k	-0,565 (0,139)
CI4	k	0,050 (0,134)
CR1	k	-0,640 (0,125)
CR2	k	0,992 (0,150)
CR3	k	-0,901 (0,121)
CR4	k	0,259 (0,122)

Regressions of the trait factors on the second-order disposition factors are given in Table 85.

TABLE 85

Regressions of Trait Factors on Second-Order Disposition Factors. Standard Errors in Brackets. Priv Sample

	SECOND-ORDER FACTOR		
Factor Type	E	I	R
a	3,322 (0,244)	3,350 (0,239)	3,623 (0,252)
b	0,583 (0,085)	0,992 (0,092)	0,875 (0,078)
c	0,391 (0,147)	0,560 (0,153)	0,741 (0,121)

Second-order factor intercorrelations are presented in Table 86 and method factor intercorrelations in Table 87.

TABLE 86

Second-order Factor Intercorrelations, Multiple-Disposition Model. Standard Errors in Brackets. Priv Sample

	E	I
I	0,940 (0,016)	
R	0,973 (0,012)	0,936 (0,015)

TABLE 87

Method Factor Intercorrelations, Multiple-Disposition Model. Standard Errors in Brackets. Priv Sample

	t	l	sd	bi
l	0,849 (0,122)			
sd	-0,090 (0,182)	-0,086 (0,180)		
bi	0,205 (0,128)	0,246 (0,120)	0,048 (0,108)	
k	0,670 (0,136)	0,802 (0,118)	0,218 (0,128)	0,233 (0,087)

Uniquenesses of the first-order trait factors are shown in Table 88.

TABLE 88

Uniquenesses of Trait Factor, Multiple-Disposition Model. Standard Errors in Brackets. Priv Sample

Factor	Uniqueness	Factor	Uniqueness	Factor	Uniqueness
a_E	0,129 (0,300)	a_I	0,597 (0,275)	a_R	0,375 (0,244)
b_E	0,0	b_I	0,0	b_R	0,065 (0,026)
c_E	0,0	c_I	0,006 (0,017)	c_R	0,0

Uniquenesses of the manifest variables are displayed in Table 89.

TABLE 89

Uniquenesses of the Manifest Variables, Multiple-Disposition Model. Standard Errors in Brackets. Priv Sample

	E	I	R
T	3,213 (0,472)	2,210 (0,395)	2,895 (0,431)
L	3,891 (0,486)	1,925 (0,317)	2,438 (0,387)
SD	8,655 (1,200)	9,206 (1,301)	0,0
BI1	0,0	0,821 (0,094)	0,520 (0,063)
BI2	0,508 (0,058)	0,954 (0,106)	0,372 (0,044)
BI3	0,965 (0,106)	0,309 (0,037)	0,298 (0,053)
C1	2,414 (0,291)	3,285 (0,373)	1,705 (0,208)
C2	3,285 (0,434)	1,209 (0,180)	2,247 (0,285)
C3	2,291 (0,264)	2,057 (0,260)	1,270 (0,190)
C4	2,273 (0,281)	2,153 (0,241)	2,153 (0,187)

We move now to the Pub results. The following modifications were made to the model.

(1) The uniquenesses of b_E, a_I and c_R were set to zero.

(2) The uniquenesses of SDR and BIE1 were set to zero.

The χ^2 index of fit was 490,50 with 363 degrees of freedom. This is associated with a probability level less than 0,001. The GFI and AGFI indices were 0,647 and 0,548 respectively. Although the model proved to be a poor fit on the Pub data, nevertheless the fit was considerably better than on the Priv data. Tables 90 to 96 display the Pub results.

TABLE 90

Factor Loadings on the Dispositional Factors, Multiple-Disposition Model. Standard Errors in Brackets. Pub Sample

		SUBDOMAIN		
Measures	Factor Type	E	I	R
T	a	1,000 (0,0)	1,000 (0,0)	1,000 (0,0)
L	a	0,845 (0,062)	1,254 (0,086)	1,068 (0,065)
SD	a	1,695 (0,131)	2,385 (0,185)	1,897 (0,118)
BI1	b	1,000 (0,0)	1,000 (0,0)	1,000 (0,0)
BI2	b	1,468 (0,173)	0,746 (0,111)	0,688 (0,069)
BI3	b	1,327 (0,157)	0,772 (0,099)	0,975 (0,075)
C1	c	1,000 (0,0)	1,000 (0,0)	1,000 (0,0)
C2	c	2,327 (0,859)	1,614 (0,253)	1,375 (0,308)
C3	c	2,651 (0,919)	1,148 (0,169)	0,862 (0,195)
C4	c	1,139 (0,534)	1,426 (0,230)	1,748 (0,335)

TABLE 91

Loadings on the Method Factors, Multiple-Disposition Model. Standard Errors in Brackets. Pub Sample

Measure	Factor	Loading
TE	t	1,000 (0,0)
TI	t	0,559 (0,238)
TR	t	1,145 (0,267)
LE	l	1,000 (0,0)
LI	l	0,800 (0,229)
LR	l	1,294 (0,301)
SDE	sd	1,000 (0,0)
SDI	sd	1,715 (0,388)
SDR	sd	3,549 (0,290)
BIE1	bi	1,000 (0,0)
BIE2	bi	0,254 (0,079)
BIE3	bi	0,291 (0,077)
BII1	bi	0,276 (0,088)
BII2	bi	-0,049 (0,087)
BII3	bi	0,425 (0,069)
BIR1	bi	0,222 (0,069)
BIR2	bi	0,476 (0,066)
BIR3	bi	0,345 (0,071)
CE1	k	1,000 (0,0)
CE2	k	0,233 (0,194)
CE3	k	0,426 (0,151)
CE4	k	-0,743 (0,146)
CI1	k	-0,833 (0,148)
CI2	k	0,517 (0,145)
CI3	k	-0,573 (0,145)
CI4	k	0,372 (0,150)
CR1	k	-0,284 (0,125)
CR2	k	0,324 (0,175)
CR3	k	-0,437 (0,121)
CR4	k	0,800 (0,133)

TABLE 92

Regressions of Trait Factors on Second-Order Disposition Factors. Standard Errors in Brackets. Pub Sample

	SECOND-ORDER FACTOR		
Factor Type	E	I	R
a	3,185 (0,249)	2,741 (0,225)	3,324 (0,253)
b	0,730 (0,094)	0,965 (0,103)	1,115 (0,088)
c	0,456 (0,161)	0,933 (0,135)	0,692 (0,114)

TABLE 93

Second-order Factor Intercorrelations, Multiple-Disposition Model. Standard Errors in Brackets. Pub Sample

	E	I
I	0,918 (0,021)	
R	0,900 (0,023)	0,921 (0,018)

TABLE 94

Method Factor Intercorrelations, Multiple-Disposition Model. Standard Errors in Brackets. Pub Sample

	t	l	sd	bi
l	0,628 (0,160)			
sd	0,295 (0,154)	0,093 (0,162)		
bi	0,539 (0,122)	0,311 (0,128)	0,348 (0,089)	
k	0,524 (0,158)	0,369 (0,152)	-0,016 (0,119)	0,212 (0,095)

TABLE 95

Uniquenesses of Trait Factor, Multiple-Disposition Model. Standard Errors in Brackets. Pub Sample

Factor	Uniqueness
a_E	0,408 (0,365)
b_E	0,0
c_E	0,030 (0,036)

Factor	Uniqueness
a_I	0,00
b_I	0,009 (0,065)
c_I	0,172 (0,070)

Factor	Uniqueness
a_R	0,186 (0,295)
b_R	0,030 (0,043)
c_R	0,0

TABLE 96

Uniquenesses of the Manifest Variables, Multiple-Disposition Model.
Standard Errors in Brackets. Pub Sample

	SUBDOMAIN		
Measures	E	I	R
T	2,655 (0,470)	3,498 (0,455)	2,606 (0,482)
L	3,067 (0,470)	2,083 (0,377)	2,489 (0,587)
SD	14,096 (1,946)	13,931 (1,877)	0,0
BI1	0,0	1,045 (0,136)	0,473 (0,069)
BI2	0,774 (0,097)	1,037 (0,125)	0,559 (0,068)
BI3	0,783 (0,096)	0,664 (0,085)	0,546 (0,075)
C1	2,754 (0,353)	1,622 (0,254)	1,599 (0,190)
C2	3,786 (0,469)	1,352 (0,233)	3,171 (0,369)
C3	2,008 (0,321)	1,677 (0,237)	1,430 (0,177)
C4	1,895 (0,264)	1,795 (0,247)	1,378 (0,200)

11.2.4 General comments on the multiple-disposition model

The difficulty of securing good fits to the data in large models is illustrated by these results. The three applications of the single-disposition model in the Pub sample all proved to fit the data quite well. The multiple-disposition model is conceptually not greatly dissimilar from the single-disposition model. In the former model, the E, I and R sections of the model are single-disposition models. These are allowed to correlate with one another. The main conceptual difference between the single- and multiple-disposition models is the inclusion of method factors in the latter. Although the multiple-disposition model was not relaxed as the single disposition model was by allowing certain manifest variable uniquenesses to correlate, inspection of the Pub matrix of modification indices of the multiple-disposition model indicates that the model would be unlikely to provide a good fit even if several uniquenesses were allowed to correlate.

The magnitude of many parameters can be compared in the single-disposition and multiple-disposition models. Comparison of factor loadings reveals that the values of corresponding parameters in the two models are very similar in most cases; the same is true of trait factor regressions. For example: the LE and SDE factor loadings in the single-disposition model as applied to the Pub data are 0,831 and 1,584, respectively. Comparable loadings in the multiple-disposition model are 0,845 and 1,695, respectively. The uniquenesses of the measurement variables are also fairly similar in the two models, but not quite as much so as is the case for the Λ_T and Γ parameters. Corresponding factor uniquenesses differ quite widely. The consistency of parameter values is closely related to the standard errors of these values. Most of the factor uniqueness values are rather unstable. It is probably for this reason that factor uniquenesses were sometimes estimated to be negative quantities. It is to be hoped that future versions of LISREL will offer constrained optimization solutions which will prevent the occurrence of unacceptable parameter estimations such as negative variances and correlations greater than unity.

Comparisons of corresponding parameter values on the Priv and Pub samples also indicate a fairly high degree of similarity for some classes of parameters. The Λ_T and Γ estimates are quite similar, with the exception of some loadings on the consequences (c) factors. Most corresponding measurement uniquenesses are also quite similar, but not trait factor uniquenesses.

There are other comparisons which can be made between the two applications of the multiple-disposition model - those pertaining to the Λ_M submatrix and the Φ matrix. The former contains the method loading and the latter the factor intercorrelations. Taken as a whole, the Λ_M estimates are roughly comparable in the two samples. It is not greatly surprising that the corresponding method factor loadings are somewhat less comparable than corresponding trait factor loadings. The trait content of items was clearly manifest and comprehensible to members of both samples and was probably interpreted in very similar ways in the two samples. Method features of items, on the other hand, are more susceptible to differential interpretations in different groups of people. The familiarity of different groups with various kinds of multichoice questionnaire material is likely to have an important influence in this regard. An overwhelming proportion of the method factor loadings are significant at the 0,05 level, indicating the participation of method influence on scores.

A remarkable feature of the loadings on k method factor is that a large number of these are negative. An inspection of the items concerned revealed a fairly close correspondence between the direction of the item and the direction of the loading. With few exceptions, items which were phrased in a negative direction (i.e., items which stated negative consequences of Black advancement) loaded negatively on the factor, and vice versa. This finding illustrates how apparently unimportant "vehicle" features of questionnaire material can influence responses. For this reason a deliberate effort was made in the construction of the T methodology to circumvent the problem of item directionality. The problem is likely to be much more severe in groups with low schooling levels; individuals with low levels of literacy are apt to be strongly influenced by peculiarities and asymmetries in the vehicle aspect of the stimulus material.

The Φ matrix consists of two sets of intercorrelations: those among traits and those among methods. The magnitudes of the trait intercorrelations are very similar to those found between the affect factors in the MTMM analyses reported in the earlier part of this chapter. All three subdomains are highly intercorrelated, especially in the Priv sample. The magnitudes of corresponding method factor intercorrelations differ quite markedly between the two samples in several instances. Many of the estimates are fairly unstable making interpretation difficult.

Inspection of the tables of normalized residuals for the two applications of the models reveals, not surprisingly, that there are far more high residuals in the Priv solution than in the Pub. In the former, there are 71 residuals in excess of 0,8 and in the latter 32. In the Priv residual matrix, most cognitive and conative measures are represented in the residuals over 0,8; but in the Pub residual matrix, only three variables feature prominently: CE1, BII1 and BII3. These findings are concordant with those of the single-disposition analyses. The model appears to be unable to accommodate individuals' cognitive, and possibly also conative, responses adequately in the Priv Sample. In the Pub sample, the inadequacies of the model appear to be largely restricted to measurement problems which might have been alleviated by allowing certain uniquenesses to covary.

There are many more parameters, both fixed and free, in the multiple-disposition model than in the single-disposition model: 1138, as opposed to 95. The former model tests the dispositional structure more rigorously than the latter because there is greater scope for inadequacies in the structure to manifest themselves. Inspection of the matrix of modification indices (or the matrix of first-order derivatives) can assist in the identification of inadequacies. If a fixed parameter has a high modification index, this is an indication that the fit of the model would improve if the parameter in question were freed. High modification indices in the structural submodel are more "serious" than high modification indices in the measurement submodel, because the implications for the hypothesis are more severe in the latter case. Of the 1138 parameters in the multiple-disposition model, 101 are free in the Priv sample and 102 in the Pub; in both samples, 27 parameters are fixed to unity to make the model determinable. Hence, there are 1010 Pub and 1009 Priv parameters which are constrained to zero. In the Priv sample, 213 of these are of a purely structural nature, and in the Pub sample, 212 (all structural parameters are in the Γ, Φ and Ψ matrices). In contrast, there are only three fixed structural parameters in the single-disposition model (all in Ψ).

Inspection of the modification indices of the fixed structural parameters in the multiple-disposition model reveals two high modification indices in the Priv analysis and one in the Pub analysis. All are in the Ψ matrix. In the Priv data, the parameters representing the following correlations have high modification indices: between the uniquenesses of the E and R cognitive factors; and between the uniquenesses of the I and R conative factors. In the Pub data, a high modification index was obtained for the parameter representing the correlation between the uniquenesses of I and R conative factors. These findings do not constitute strong evidence against the dispositional structure: it is not particularly unexpected to find that the uniquenesses of closely related factors are correlated.

The information obtained from the examination of the residuals and modification indices can be synthesized thus: the dispositional model is the "right sort" of model, but it is not sufficiently elaborated.

The model is satisfactory "as far as it goes", but more complex structures are necessary to describe cognitive, and possibly conative, phenomena.

12.0 BLACK ADVANCEMENT DATA ANALYSIS IV: CAUSAL MODELS

In this chapter, which investigates Postulate 4, we shall report the findings on the examination of the two causal or behaviour prediction models. The two models are the Fishbein-Ajzen model and a new causal model which is constituted of dispositional and social pressure submodels.

We shall describe the parameterization of the two causal models before presenting the results.

12.1 Parameterization of the Fishbein-Ajzen Model

In the single-disposition and multiple-disposition structures, we used special cases of the LISREL statistical model. In order to parameterize the Fishbein-Ajzen model, however, the full model is required.

The Λ matrix used in the single- and multiple-disposition models is actually a Λ_y matrix in the terminology of Section 7.5. Also, the Σ matrix in both these models is actually a Σ_{yy} matrix. In the Fishbein-Ajzen model, we have both exogenous and endogenous latent variables. Σ is a covariance matrix of x and y variables and the decomposition of Σ requires all the matrices of the LISREL, or Jöreskog, model. These are: Λ_x, Λ_y, B, Γ, Φ, Ψ, Θ_δ and Θ_ε.

The matrices Λ_x and Λ_y are, respectively, the matrices of loadings of manifest variables on the exogenous and endogenous factors. The B matrix contains the regression coefficients of endogenous factors on one another, and Γ contains regression coefficients of endogenous factors on exogenous factors. The covariances amongst exogenous factors are in the Φ matrix. Uniquenesses of the endogenous factors appear in the Ψ matrix, and the uniquenesses of the x and y manifest variables are in the Θ_δ and Θ_ε matrices respectively. The Ψ, Θ_δ and Θ_ε matrices are diagonal unless covariance amongst uniquenesses is permitted.

For the Fishbein-Ajzen model, the following covariance structure is posited:

$$\Sigma = \left[\begin{array}{c|c} \Lambda_y B^{-1}(\Gamma\Phi\Gamma' + \Psi)B'^{-1}\Lambda'_y + \Theta^2_\varepsilon & \Lambda_y B^{-1}\Gamma\Phi\Lambda'_x \\ \hline \Lambda_x\Phi\Gamma' B'^{-1}\Lambda'_y & \Lambda_x\Phi\Lambda'_x + \Theta^2_\delta \end{array}\right]$$

where

- Σ is (18x18),
- Λ_y is (8x3),
- B is (3x3),
- Γ is (3x3),
- Φ is (3x3),
- Ψ is (3x3) diagonal,
- Θ^2_ε is (8x8) diagonal,
- Λ_x is (10x3), and
- Θ^2_δ is (10x10) diagonal.

The following are 18 variables included in the model:

- 3 measures of affect
- 3 measures of conation
- 4 measures of cognition
- 3 measures of managerial social pressure
- 3 measures of coworker social pressure
- 2 measures of behaviour.

The cognitive, managerial pressure and coworker pressure constructs are exogenous and the affective, conative and behavioural constructs endogenous.

The model is illustrated in Figure 25.

The structural relationship among the latent variables are expressed as follows (using the terminology of Figure 25):

$$\eta = B\eta + \Gamma\xi + \zeta$$

where

- η is a (3x1) matrix of endogenous factors,
- B and Γ are as before,
- ζ is a (3x1) matrix of endogenous factor uniquenesses.

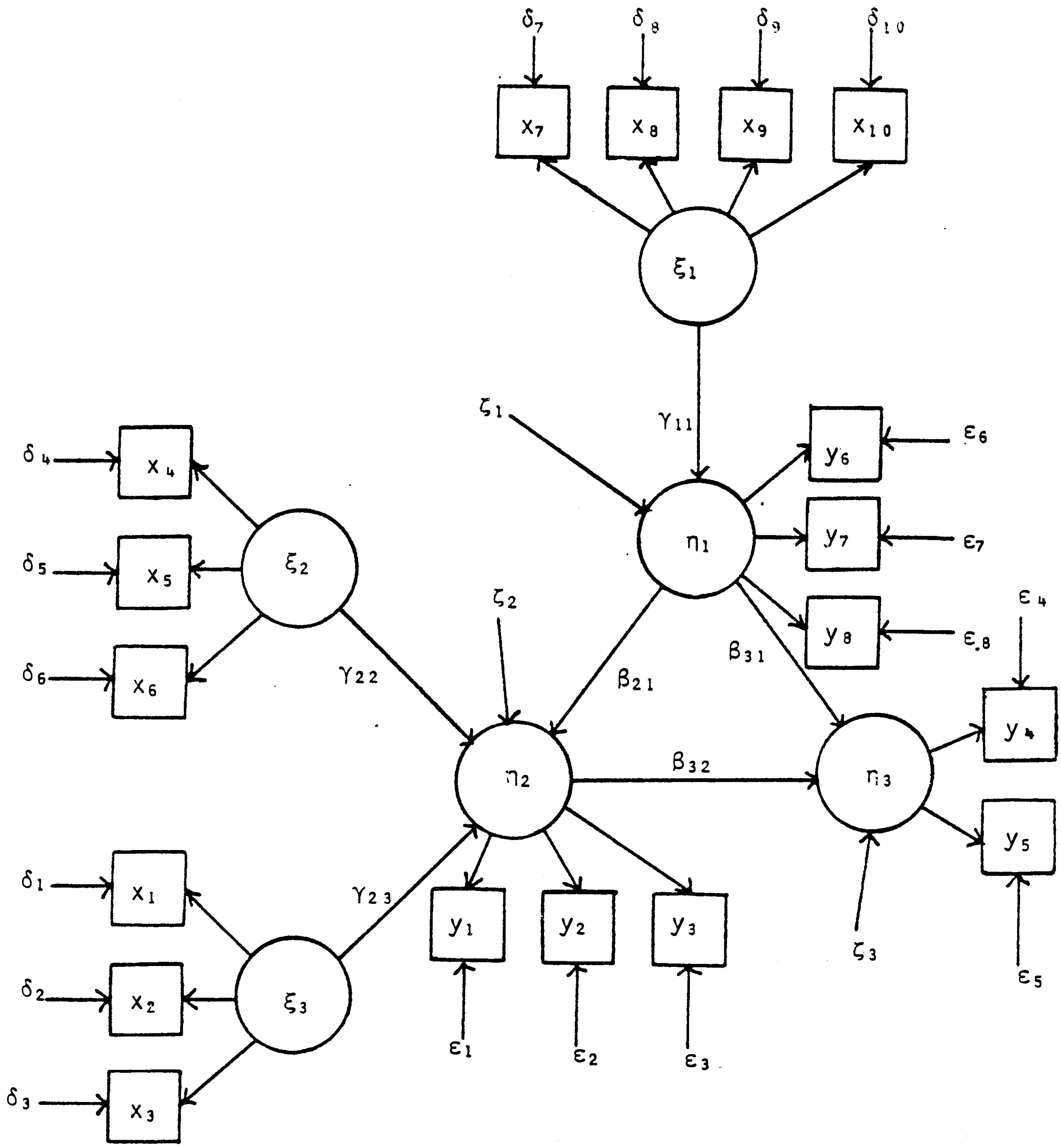


Figure 25. Fishbein-Ajzen Model
(See overleaf for key)

Key to Figure 25

(1) ξ_1 is cognition (c).

(2) ξ_2 is managerial pressure (pm).

(3) ξ_3 is coworker pressure (pc).

(4) η_1 is affect (a).

(5) η_2 is behavioural intention (b).

(6) η_3 is behaviour (B).

(7) x_1, x_2, x_3 are PC1, PC2, PC3 respectively.

(8) x_4, x_5, x_6 are PM1, PM2, PM3 respectively.

(9) x_7, x_8, x_9, x_{10} are C1, C2, C3, C4 respectively.

(10) y_1, y_2, y_3 are BI1, BI2, BI3 respectively.

(11) y_4 and y_5 are B1 and B2 respectively.

(12) y_6, y_7, y_8 are T, L, SD respectively.

NOTE

β_{ij} indicates the regression of η_i on η_j. Similarly, γ_{ij} indicates the regression of η_i on ξ_j. The subscripts also indicate the positions of parameters in their matrices.

In expanded form:

$$\begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 \\ \beta_{21} & 0 & 0 \\ \beta_{31} & \beta_{32} & 0 \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \end{bmatrix} + \begin{bmatrix} \gamma_{11} & 0 & 0 \\ 0 & \gamma_{22} & \gamma_{23} \\ 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \end{bmatrix} + \begin{bmatrix} \zeta_1 \\ \zeta_2 \\ \zeta_3 \end{bmatrix} .$$

The matrix η appears on both sides of the equation as a consequence of redefining B (see Subsection 11.2.1).

12.2 Parameterization of the New Model

The new causal model incorporates the second-order factor which we have encountered in the dispositional models. The new model is remarkable, however, in that there is prediction from the second-order factor. This creates parameterization problems, as the LISREL model is not intended to be used for structures of this kind.

It was therefore necessary to adopt a Bentler-Weeks parameterization (see Section 7.5). This parameterization involves using LISREL in a non-standard fashion. A correspondence may be made between the Bentler-Weeks model and Σ_{yy} of the LISREL model. In Bentler-Weeks,

$$\Sigma_{yy} = G_y\beta^{-1}\gamma\Phi\gamma'\beta'^{-1}G'_y$$

where

- Σ_{yy} is the covariance matrix of manifest variables,
- G_y is a known selection matrix with zero entries except for a single unity in each row,
- β is a matrix of regression coefficients of links between dependent variables,
- γ is a matrix of regression coefficients of links between independent and dependent variables, and
- Φ is a matrix of covariances of the independent variables.

In LISREL,

$$\Sigma_{yy} = \Lambda_y B^{-1}(\Gamma\Phi\Gamma' + \Psi)B'^{-1}\Lambda'_y + \Theta^2_\varepsilon .$$

The two models become comparable if one takes $G=\Lambda_y$, $\beta=B$, $\gamma=\Gamma$, $\Phi=\Phi$, $\Psi=0$ and $\Theta^2_\varepsilon=0$.

A reinterpretation of variables is necessary. All endogenous and manifest variables must be classified as dependent variables; also all exogenous variables, and errors/uniquenesses of factors and manifest variables must be classified as independent variables.

The new causal model with Bentler-Weeks parameterization is illustrated in Figure 26.

The following is a description of the Λ, B, Γ and Φ matrices of the new model.

The matrix Λ is (18x22). The manifest variables can be ordered in such a way that Λ may be partitioned:

$$\Lambda = [I \; Z]$$

where

- I is an (18x18) identity matrix, and
- Z is an (18x4) zero matrix.

The 18 unities in Λ select the appropriate manifest variables.

Matrix B is (22x22). This may be partitioned:

$$B = [Z \; B_1]$$

where

- Z is a (22x18) zero matrix, and
- B_1 is a (22x4) matrix of manifest variable loadings on η_i latent variables.

Matrix Γ is (22x25). If variables are labelled in such a way that the subscript of each ξ_i uniqueness variable is the same as the subscript of the η_i variable on which it has an effect, then we may partition Γ:

$$\Gamma = [D \; \Gamma_1]$$

where

- D is a (22x22) diagonal matrix of uniquenesses, and
- Γ_1 is a (22x3) matrix of manifest variable loadings on ξ_i latent variables and of regression coefficients of η_i latent factors on ξ_i latent factors.

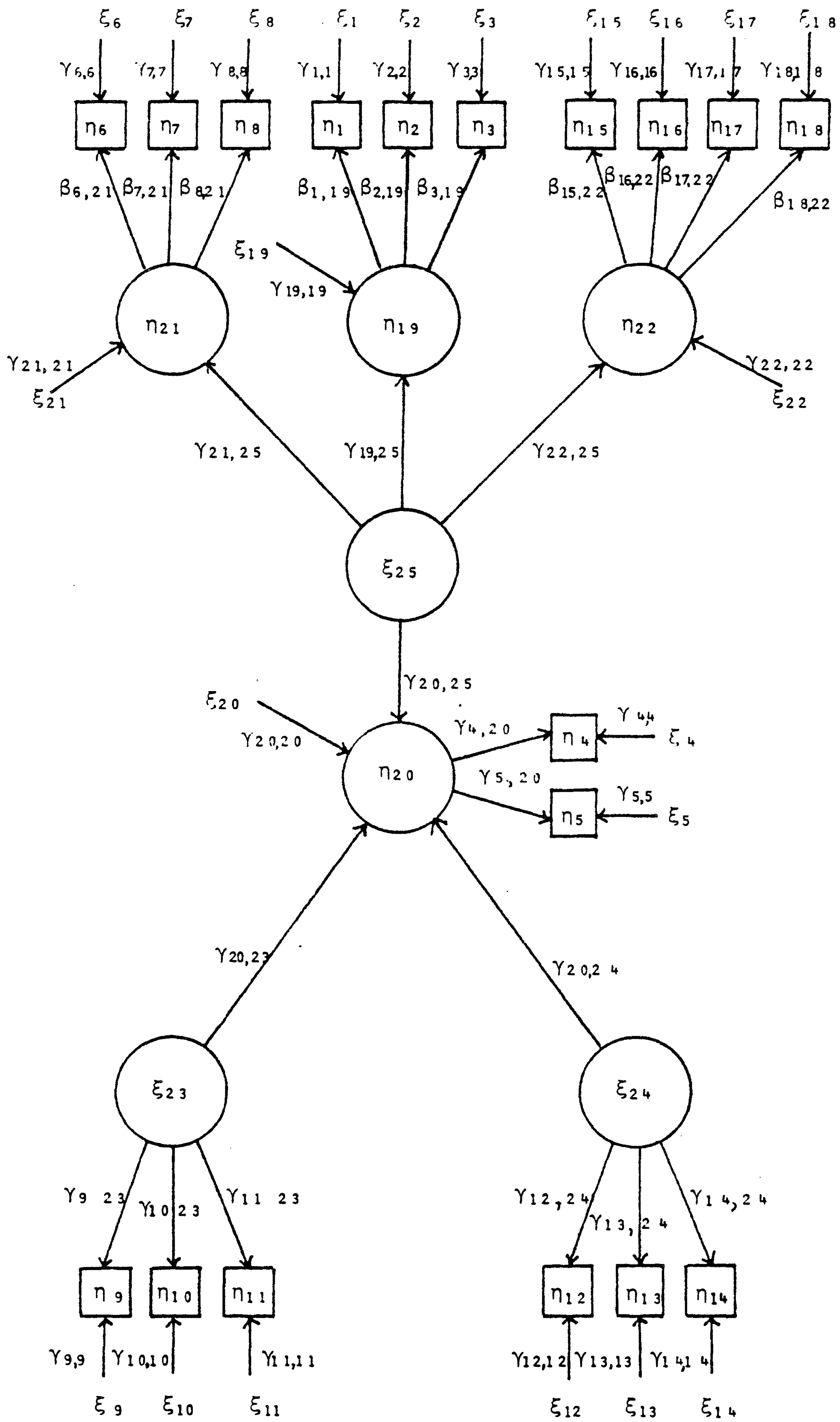


Figure 26. New Causal Model
(See overleaf for key)

Key to Figure 26

(1) η_{19} is behavioural intention (BI).

(2) η_{20} is behaviour (B).

(3) η_{21} is affect (a).

(4) η_{22} is cognition (c).

(5) ξ_{23} is coworker pressure (pc).

(6) ξ_{24} is managerial pressure (pm).

(7) ξ_{25} is disposition (d).

(8) η_1, η_2, η_3 are BI1, BI2, BI3 respectively.

(9) η_4 and η_5 are B1 and B2 respectively.

(10) η_6, η_7, η_8 are T, L, SD respectively.

(11) η_9, η_{10}, η_{11} are PC1, PC2, PC3 respectively.

(12) η_{12}, η_{13}, η_{14} are PM1, PM2, PM3 respectively.

(13) η_{15}, η_{16}, η_{17}, η_{18} are C1, C2, C3, C4 respectively.

NOTE

Commas have been used to separate i subscripts from j subscripts in the γ parameters.

Matrix Φ is a (25x25) matrix of intercorrelations amongst all ξ_i variables. The matrix is composed of zeros except for unities in the diagonal and free parameters for intercorrelations between ξ_{23}, ξ_{24} and ξ_{25}, which are coworker pressure, managerial pressure and disposition factors respectively (see Figure 26). If certain uniquenesses are allowed to covary, then the appropriate elements of Φ are freed.

The submatrices B_1 and Γ_1 are shown in Table 97. Notice that the first entry in each column of Γ_1 is not unity because the scaling is achieved by placing unities, rather than covariances in the diagonal of Φ. The Γ_1 submatrix incorporates both structural and measurement parameters: no fundamental distinction is made between these in the Bentler-Weeks parameterization. The structural parameters which appear in the Γ_1 matrix are regression coefficients of η_i latent variables on ξ_j latent variables. The measurement parameters which appear in Γ_1 are loadings of manifest variables on ξ_k latent variables. Both structural and measurement parameters also appear in the B matrix in the Bentler-Weeks parameterization. The structural parameters are regressions of η_i latent variables on other η_j latent variables; and the measurement parameters are loadings of manifest variables on η_k latent variables. In the causal model currently under consideration, there are no structural links between η_i and η_j latent variables: hence the free parameters in B_1 are all measurement parameters in this case.

12.3 Results: Fishbein-Ajzen Model

Table 98 lists the variances of all manifest variables used in the causal models. Reference to this table will facilitate interpretation of loadings and uniquenesses.

The χ^2 goodness-of-fit statistic is influenced by the kurtosis of variables. Table 99 lists these for the variables in the causal models.

Table 99 indicates that the departures from neutral kurtosis are not more marked in one sample. Hence the goodness-of-fit statistic will

TABLE 97

Matrices B_1 and Γ_1: New Causal Model

		B_1				Γ_1		
		η_{19}	η_{20}	η_{21}	η_{22}	ξ_{23}	ξ_{24}	ξ_{25}
η_1	(BI1)	1,000	0,0	0,0	0,0	0,0	0,0	0,0
η_2	(BI2)	$\beta_{2\ 19}$	0,0	0,0	0,0	0,0	0,0	0,0
η_3	(BI3)	$\beta_{3\ 19}$	0,0	0,0	0,0	0,0	0,0	0,0
η_4	(B1)	0,0	1,000	0,0	0,0	0,0	0,0	0,0
η_5	(B2)	0,0	$\beta_{5\ 20}$	0,0	0,0	0,0	0,0	0,0
η_6	(T)	0,0	0,0	1,000	0,0	0,0	0,0	0,0
η_7	(L)	0,0	0,0	$\beta_{7\ 21}$	0,0	0,0	0,0	0,0
η_8	(SD)	0,0	0,0	$\beta_{8\ 21}$	0,0	0,0	0,0	0,0
η_9	(PC1)	0,0	0,0	0,0	0,0	$\gamma_{9\ 23}$	0,0	0,0
η_{10}	(PC2)	0,0	0,0	0,0	0,0	$\gamma_{10\ 23}$	0,0	0,0
η_{11}	(PC3)	0,0	0,0	0,0	0,0	$\gamma_{11\ 23}$	0,0	0,0
η_{12}	(PM1)	0,0	0,0	0,0	0,0	0,0	$\gamma_{12\ 24}$	0,0
η_{13}	(PM2)	0,0	0,0	0,0	0,0	0,0	$\gamma_{13\ 24}$	0,0
η_{14}	(PM3)	0,0	0,0	0,0	0,0	0,0	$\gamma_{14\ 24}$	0,0
η_{15}	(C1)	0,0	0,0	0,0	1,000	0,0	0,0	0,0
η_{16}	(C2)	0,0	0,0	0,0	$\beta_{16\ 22}$	0,0	0,0	0,0
η_{17}	(C3)	0,0	0,0	0,0	$\beta_{17\ 22}$	0,0	0,0	0,0
η_{18}	(C4)	0,0	0,0	0,0	$\beta_{18\ 22}$	0,0	0,0	0,0
η_{19}	(b)	0,0	0,0	0,0	0,0	0,0	0,0	$\gamma_{19\ 25}$
η_{20}	(B)	0,0	0,0	0,0	0,0	$\gamma_{20\ 23}$	$\gamma_{20\ 24}$	$\gamma_{20\ 25}$
η_{21}	(a)	0,0	0,0	0,0	0,0	0,0	0,0	$\gamma_{21\ 25}$
η_{22}	(c)	0,0	0,0	0,0	0,0	0,0	0,0	$\gamma_{22\ 25}$

TABLE 98

Variances of Manifest Variables used in the Causal Models

	Priv			Pub		
Measures	E	I	R	E	I	R
(BI1)	0,852	1,841	1,376	1,165	2,041	1,777
(BI2)	1,359	1,656	0,999	1,958	1,561	1,307
(BI3)	1,412	0,980	1,762	1,771	1,348	1,832
(B1)	0,390	0,344	0,438	0,421	0,446	0,459
(B2)	0,309	0,337	0,332	0,325	0,352	0,316
(T)	15,555	14,933	17,118	14,087	11,268	15,036
(L)	11,300	13,255	14,267	11,322	14,489	16,866
(SD)	42,318	51,196	49,941	46,635	59,122	52,980
(PC1)	0,850	1,145	0,754	1,102	1,037	1,045
(PC2)	1,038	0,834	0,713	0,630	1,333	0,902
(PC3)	0,800	1,012	0,805	1,044	0,811	0,936
(PM1)	0,745	1,262	0,981	0,929	0,776	0,946
(PM2)	1,320	0,509	0,813	0,857	0,941	0,814
(PM3)	0,817	1,048	0,923	0,931	0,920	1,063
(C1)	3,410	3,993	2,661	3,673	3,316	2,147
(C2)	5,223	3,629	5,025	5,135	4,313	4,185
(C3)	4,730	4,181	2,726	3,872	3,362	1,955
(C4)	3,258	3,129	3,588	2,700	4,041	3,469

TABLE 99

Kurtoses of Manifest Variables used in the Causal Models

	Priv			Pub		
Measures	E	I	R	E	I	R
(BI1)	0,28	-1,01	-0,52	-0,45	-1,33	-1,31
(BI2)	0,11	-1,00	0,22	-1,08	-0,67	-0,65
(BI3)	-0,73	-0,04	-1,15	-1,19	-1,01	-1,38
(B1)	-0,64	-0,69	-0,71	-0,59	-0,72	-0,77
(B2)	-0,86	-0,74	-0,63	0,12	0,02	0,36
(T)	-0,55	-0,42	-0,60	-0,55	-0,12	-0,76
(L)	-0,62	-0,11	-0,39	-0,07	-0,22	-0,64
(SD)	0,73	-0,08	0,03	-0,78	-1,25	-1,10
(PC1)	-0,24	-0,88	0,05	-1,00	1,35	-0,88
(PC2)	-0,65	-0,44	-0,38	1,09	-1,19	-1,03
(PC3)	-0,36	-0,62	-0,07	-1,22	-0,66	-0,40
(PM1)	-0,34	-0,82	-0,27	-0,36	0,54	-0,73
(PM2)	-0,68	0,80	-0,18	0,41	-0,16	-0,36
(PM3)	-0,16	-0,75	-0,14	-0,19	-0,73	-0,66
(C1)	-0,74	-0,89	0,80	-1,29	-0,35	2,30
(C2)	-1,49	-0,22	-1,50	-1,41	-1,16	-1,11
(C3)	-1,27	-1,15	0,01	-1,37	-0,54	1,42
(C4)	-0,28	0,20	-0,63	0,19	-0,74	-0,93

NOTE: A neutral kurtosis has the value of 0, not 3.

not be biased substantially differently in the two samples.

The Priv results will be presented first.

In all three applications of the model, the following uniquenesses were allowed to covary: PC1 and PM1; PC3 and PM3; C1 and C3. These parameters were allowed to covary because of high modification indices. As all three of the above pairs share a common format, it is justifiable to allow the uniquenesses to covary. In addition, all three endogenous factor uniquenesses were constrained to be equal in the R application of the model. This was done to prevent negative uniquenesses.

Table 100 lists the χ^2 values, degrees of freedom, probability levels, GFI indices, AGFI indices and RMR indices for the E, I and R applications of the Fishbein-Ajzen Model.

TABLE 100

Goodness-of-fit statistics of the Fishbein-Ajzen Model: Priv Sample

	E	I	R
χ^2	254,85	180,23	273,82
d.f.	123	123	125
p level	0,000	0,001	0,000
GFI index	0,449	0,672	0,553
AGFI index	0,234	0,545	0,388
RMR index	0,198	0,159	0,158

Table 101 presents the Λ_y loadings and Table 102 the Λ_x loadings for the E subdomain.

TABLE 101

Matrix Λ_y of Factor Loadings, Fishbein-Ajzen Model. Standard Errors in Brackets. E Subdomain: Priv Sample

	FACTORS		
Measures	a	b	B
BIE1	0,0	1,000 (0,0)	0,0
BIE2	0,0	1,473 (0,137)	0,0
BIE3	0,0	1,016 (0,140)	0,0
BE1	0,0	0,0	1,000 (0,0)
BE2	0,0	0,0	0,896 (0,058)
TE	1,000 (0,0)	0,0	0,0
LE	0,782 (0,060)	0,0	0,0
SDE	1,544 (0,115)	0,0	0,0

TABLE 102

Matrix Λ_x of Factor Loadings, Fishbein-Ajzen Model. Standard Errors in Brackets. E Subdomain: Priv Sample

	FACTORS		
Measures	c	pm	pc
PCE1	0,0	0,0	0,576 (0,065)
PCE2	0,0	0,0	0,789 (0,070)
PCE3	0,0	0,0	0,781 (0,060)
PME1	0,0	0,602 (0,060)	0,0
PME2	0,0	0,842 (0,081)	0,0
PME3	0,0	0,787 (0,060)	0,0
CE1	0,487 (0,151)	0,0	0,0
CE2	0,974 (0,178)	0,0	0,0
CE3	1,606 (0,153)	0,0	0,0
CE4	0,455 (0,145)	0,0	0,0

The B matrix for the E subdomain is shown in Table 103.

TABLE 103

Matrix B of Regression Coefficients, Fishbein-Ajzen Model. Standard Errors in Brackets. E Subdomain: Priv Sample

	a	b	B
a	0,0	0,0	0,0
b	0,150 (0,023)	0,0	0,0
B	0,041 (0,044)	0,445 (0,231)	0,0

The Γ matrix for the E subdomain is presented in Table 104.

TABLE 104

Matrix Γ of Regression Coefficients, Fishbein-Ajzen Model. Standard Errors in Brackets. E Subdomain: Priv Sample

	c	pm	pc
a	3,194 (0,271)	0,0	0,0
b	0,0	0,120 (0,053)	0,048 (0,071)
B	0,0	0,0	0,0

The Φ matrix appears in Table 105.

TABLE 105

Matrix Φ of Exogenous Factor Intercorrelations, Fishbein-Ajzen Model. Standard Errors in Brackets. E Subdomain: Priv Sample.

	c	pm	pc
c	1,000		
pm	0,640 (0,062)	1,000	
pc	0,806 (0,047)	0,655 (0,058)	1,000

The diagonal of Ψ is shown in Table 106.

TABLE 106

Diagonal of Ψ: Endogenous Factor Uniquenesses, Fishbein-Ajzen Model. Standard Errors in Brackets. E Subdomain: Priv Sample

a	b	B
1,599 (0,810)	0,056 (0,025)	0,138 (0,022)

The uniqunesses of the manifest variables are shown in Table 107.

TABLE 107

Matrices Θ_ε and Θ_δ of Manifest Variable Uniquenesses, Fishbein-Ajzen Model. Standard Errors in Brackets. E Subdomain: Priv Sample

	Θ_ε		Θ_δ
BIE1	0,399 (0,050)	PCE1	0,489 (0,059)
BIE2	0,377 (0,063)	PCE2	0,415 (0,060)
BIE3	0,945 (0,108)	PCE3	0,219 (0,044)
BE1	0,064 (0,017)	PME1	0,370 (0,048)
BE2	0,048 (0,013)	PME2	0,611 (0,084)
TE	3,754 (0,582)	PME3	0,199 (0,047)
LE	4,089 (0,529)	CE1	3,173 (0,347)
SDE	14,190 (1,886)	CE2	4,274 (0,478)
		CE3	2,152 (0,298)
		CE4	3,050 (0,332)

The results for the I and R subdomains will be presented in similar fashion (Tables 108-121).

TABLE 108

Matrix Λ_y of Factor Loadings, Fishbein-Ajzen Model. Standard Errors in Brackets. I Subdomain: Priv Sample

	FACTORS		
Measures	a	b	B
BII1	0,0	1,000 (0,0)	0,0
BII2	0,0	0,839 (0,096)	0,0
BII3	0,0	0,758 (0,073)	0,0
BI1	0,0	0,0	1,000 (0,0)
BI2	0,0	0,0	1,019 (0,068)
TI	1,000 (0,0)	0,0	0,0
LI	0,949 (0,103)	0,0	0,0
SDI	1,798 (0,050)	0,0	0,0

TABLE 109

Matrix Λ_x of Factor Loadings, Fishbein-Ajzen Model. Standard Errors in Brackets. I Subdomain: Priv Sample

	FACTORS		
Measures	c	pm	pc
PCI1	0,0	0,0	0,695 (0,078)
PCI2	0,0	0,0	0,639 (0,066)
PCI3	0,0	0,0	0,754 (0,071)
PMI1	0,0	0,770 (0,086)	0,0
PMI2	0,0	0,447 (0,056)	0,0
PMI3	0,0	0,652 (0,080)	0,0
CI1	0,563 (0,156)	0,0	0,0
CI2	1,514 (0,124)	0,0	0,0
CI3	1,313 (0,144)	0,0	0,0
CI4	0,963 (0,129)	0,0	0,0

TABLE 110

Matrix B of Regression Coefficients, Fishbein-Ajzen Model. Standard Errors in Brackets. I Subdomain: Priv Sample

	a	b	B
a	0,0	0,0	0,0
b	0,205 (0,040)	0,0	0,0
B	-0,163 (0,126)	0,998 (0,447)	0,0

TABLE 111

Matrix Γ of Regression Coefficients, Fishbein-Ajzen Model. Standard Errors in Brackets. I Subdomain: Priv Sample

	c	pm	pc
a	3,366 (0,242)	0,0	0,0
b	0,0	0,119 (0,074)	0,203 (0,107)
B	0,0	0,0	0,0

TABLE 112

Matrix Φ of Exogenous Factor Intercorrelations, Fishbein-Ajzen Model. Standard Errors in Brackets. I Subdomain: Priv Sample

	c	pm	pc
c	1,000		
pm	0,765 (0,057)	1,000	
pc	0,864 (0,041)	0,688 (0,072)	1,000

TABLE 113

Diagonal of Ψ: Endogenous Factor Uniqueness ishbein-Ajzen Model. Standard Errors in Brackets. I Subdomain: Priv Sample

a	b	B
0,924 (0,502)	0,037 (0,037)	0,046 (0,028)

TABLE 114

Matrices Θ_ε and Θ_δ of Manifest Variable Uniquenesses, Fishbein-Ajzen Model. Standard Errors in Brackets. I Subdomain: Priv Sample

	Θ_ε		Θ_δ
BII1	0,828 (0,096)	PCI1	0,657 (0,082)
BII2	0,943 (0,106)	PCI2	0,426 (0,056)
BII3	0,398 (0,047)	PCI3	0,445 (0,064)
BI1	0,077 (0,014)	PMI1	0,668 (0,098)
BI2	0,060 (0,013)	PMI2	0,310 (0,041)
TI	2,679 (0,391)	PMI3	0,632 (0,085)
LI	2,227 (0,335)	CI1	3,676 (0,400)
SDI	11,579 (1,549)	CI2	1,338 (0,175)
		CI3	2,458 (0,283)
		CI4	2,202 (0,247)

TABLE 115

Matrix Λ_y of Factor Loadings, Fishbein-Ajzen Model. Standard Errors in Brackets. R Subdomain: Priv Sample

	FACTORS		
Measures	a	b	B
BIR1	0,0	1,000 (0,0)	0,0
BIR2	0,0	0,800 (0,076)	0,0
BIR3	0,0	1,358 (0,094)	0,0
BR1	0,0	0,0	1,000 (0,0)
BR2	0,0	0,0	0,849 (0,053)
TR	1,000 (0,0)	0,0	0,0
LR	0,901 (0,048)	0,0	0,0
SDR	1,695 (0,090)	0,0	0,0

TABLE 116

Matrix Λ_x of Factor Loadings, Fishbein-Ajzen Model. Standard Errors in Brackets. R Subdomain: Priv Sample

	FACTORS		
Measures	c	pm	pc
PCR1	0,0	0,0	0,218 (0,074)
PCR2	0,0	0,0	0,664 (0,069)
PCR3	0,0	0,0	0,484 (0,072)
PMR1	0,0	0,573 (0,080)	0,0
PMR2	0,0	0,646 (0,071)	0,0
PMR3	0,0	0,679 (0,076)	0,0
CR1	0,604 (0,123)	0,0	0,0
CR2	1,444 (0,156)	0,0	0,0
CR3	0,675 (0,124)	0,0	0,0
CR4	1,346 (0,127)	0,0	0,0

TABLE 117

Matrix B of Regression Coefficients, Fishbein-Ajzen Model. Standard Errors in Brackets. R Subdomain: Priv Sample

	a	b	B
a	0,0	0,0	0,0
b	0,210 (0,026)	0,0	0,0
B	-0,026 (0,039)	0,653 (0,166)	0,0

TABLE 118

Matrix Γ of Regression Coefficients, Fishbein-Ajzen Model. Standard Errors in Brackets. R Subdomain: Priv Sample

	c	pm	pc
a	3,747 (0,246)	0,0	0,0
b	0,0	0,108 (0,063)	-0,007 (0,097)
B	0,0	0,0	0,0

TABLE 119

Matrix Φ of Exogenous Factor Intercorrelations, Fishbein-Ajzen Model. Standard Errors in Brackets. R Subdomain: Priv Sample

	c	pm	pc
c	1,000		
pm	0,571 (0,070)	1,000	
pc	0,782 (0,063)	0,625 (0,086)	1,000

TABLE 120

Diagonal of Ψ: Endogenous Factor Uniquenesses, Fishbein-Ajzen Model. Standard Errors in Brackets. R Subdomain: Priv Sample

a	b	B
0,107 (0,019)	0,107 (0,019)	0,107 (0,019)

TABLE 121

Matrices Θ_ε and Θ_δ of Manifest Variable Uniquenesses, Fishbein-Ajzen Model. Standard Errors in Brackets. R Subdomain: Priv Sample

	Θ_ε		Θ_δ
BIR1	0,567 (0,067)	PCR1	0,706 (2,078)
BIR2	0,468 (0,054)	PCR2	0,273 (0,065)
BIR3	0,232 (0,049)	PCR3	0,575 (0,070)
BR1	0,069 (0,017)	PMR1	0,652 (0,084)
BR2	0,068 (0,013)	PMR2	0,396 (0,066)
TR	2,993 (0,431)	PMR3	0,471 (0,076)
LR	2,793 (0,385)	CR1	2,296 (0,250)
SDR	9,302 (1,307)	CR2	2,940 (0,330)
		CR3	2,270 (0,248)
		CR4	1,776 (0,203)

We now report the Pub results. In the model applied to the Pub data, the same set of manifest variable uniquenesses were allowed to covary as in the model applied to the Priv data. In addition, the exogenous factor uniquenesses were constrained to be equal in the I and R analyses in order to prevent the estimation of negative values.

Table 122 lists the χ^2 values, degrees of freedom, probability levels, GFI indices, AGFI indices and RMR indices for the E, I and R applications of the Fishbein-Ajzen model.

TABLE 122

Goodness-of-fit statistics of the Fishbein-Ajzen Model: Pub Sample

	E	I	R
χ^2	163,60	181,84	141,92
d.f.	123	125	125
p level	0,008	0,001	0,143
GFI index	0,711	0,661	0,783
AGFI index	0,598	0,537	0,702
RMR index	0,181	0,189	0,124

The results for the E, I and R applications are presented in similar fashion to those for the Priv Sample (Tables 123-143).

TABLE 123

Matrix Λ_y of Factor Loadings, Fishbein-Ajzen Model. Standard Errors in Brackets. E Subdomain: Pub Sample

	FACTORS		
Measures	a	b	B
BIE1	0,0	1,000 (0,0)	0,0
BIE2	0,0	1,349 (0,124)	0,0
BIE3	0,0	1,193 (0,119)	0,0
BE1	0,0	0,0	1,000 (0,0)
BE2	0,0	0,0	0,789 (0,080)
TE	1,000 (0,0)	0,0	0,0
LE	0,846 (0,060)	0,0	0,0
SDE	1,619 (0,129)	0,0	0,0

TABLE 124

Matrix Λ_x of Factor Loadings, Fishbein-Ajzen Model. Standard Errors in Brackets. E Subdomain: Pub Sample

	FACTORS		
Measures	c	pm	pc
PCE1	0,0	0,0	0,668 (0,084)
PCE2	0,0	0,0	0,454 (0,065)
PCE3	0,0	0,0	0,740 (0,080)
PME1	0,0	0,701 (0,081)	0,0
PME2	0,0	0,346 (0,083)	0,0
PME3	0,0	0,646 (0,081)	0,0
CE1	0,411 (0,166)	0,0	0,0
CE2	1,233 (0,181)	0,0	0,0
CE3	1,262 (0,152)	0,0	0,0
CE4	0,421 (0,140)	0,0	0,0

TABLE 125

Matrix B of Regression Coefficients, Fishbein-Ajzen Model. Standard Errors in Brackets. E Subdomain: Pub Sample

	a	b	B
a	0,0	0,0	0,0
b	0,153 (0,029)	0,0	0,0
B	0,163 (0,061)	-0,105 (0,238)	0,0

TABLE 126

Matrix Γ of Regression Coefficients, Fishbein-Ajzen Model. Standard Errors in Brackets. E Subdomain: Pub Sample

	c	pm	pc
a	2,894 (0,279)	0,0	0,0
b	0,0	0,135 (0,070)	0,277 (0,089)
B	0,0	0,0	0,0

TABLE 127

Matrix Φ of Exogenous Factor Intercorrelations, Fishbein-Ajzen Model. Standard Errors in Brackets. E Subdomain: Pub Sample

	c	pm	pc
c	1,000		
pm	0,734 (0,075)	1,000	
pc	0,868 (0,607)	0,585 (0,092)	1,000

TABLE 128

Diagonal of Ψ: Endogenous Factor Uniquenesses, Fishbein-Ajzen Model. Standard Errors in Brackets. E Subdomain: Pub Sample

a	b	B
2,740 (0,892)	0,003 (0,027)	0,105 (0,028)

TABLE 129

Matrices Θ_ε and Θ_δ of Manifest Variable Uniquenesses, Fishbein-Ajzen Model. Standard Errors in Brackets. E Subdomain: Pub Sample

	Θ_ε		Θ_δ
BIE1	0,466 (0,061)	PCE1	0,664 (0,090)
BIE2	0,687 (0,094)	PCE2	0,424 (0,054)
BIE3	0,776 (0,098)	PCE3	0,502 (0,079)
BE1	0,104 (0,026)	PME1	0,436 (0,083)
BE2	0,128 (0,021)	PME2	0,737 (0,088)
TE	2,971 (0,492)	PME3	0,515 (0,082)
LE	3,375 (0,475)	CE1	3,504 (0,401)
SDE	17,508 (2,295)	CE2	3,614 (0,444)
		CE3	2,279 (0,298)
		CE4	2,523 (0,289)

TABLE 130

Matrix Λ_y of Factor Loadings, Fishbein-Ajzen Model. Standard Errors in Brackets. I Subdomain: Pub Sample

	FACTORS		
Measures	a	b	B
BII1	0,0	1,000 (0,0)	0,0
BII2	0,0	0,729 (0,110)	0,0
BII3	0,0	0,814 (0,103)	0,0
BI1	0,0	0,0	1,000 (0,0)
BI2	0,0	0,0	0,803 (0,097)
TI	1,000 (0,0)	0,0	0,0
LI	1,280 (0,092)	0,0	0,0
SDI	2,394 (0,194)	0,0	0,0

TABLE 131

Matrix Λ_x of Factor Loadings, Fishbein-Ajzen Model. Standard Errors in Brackets. I Subdomain: Pub Sample

	FACTORS		
Measures	c	pm	pc
PCI1	0,0	0,0	0,296 (0,087)
PCI2	0,0	0,0	0,964 (0,094)
PCI3	0,0	0,0	0,462 (0,074)
PMI1	0,0	0,366 (0,080)	0,0
PMI2	0,0	0,616 (0,088)	0,0
PMI3	0,0	0,502 (0,086)	0,0
CI1	0,901 (0,141)	0,0	0,0
CI2	1,545 (0,145)	0,0	0,0
CI3	1,058 (0,138)	0,0	0,0
CI4	1,441 (0,142)	0,0	0,0

TABLE 132

Matrix B of Regression Coefficients, Fishbein-Ajzen Model. Standard Errors in Brackets. I Subdomain: Pub Sample

	a	b	B
a	0,0	0,0	0,0
b	0,374 (0,049)	0,0	0,0
B	-0,398 (0,442)	1,583 (1,255)	0,0

TABLE 133

Matrix Γ of Regression Coefficients, Fishbein-Ajzen Model. Standard Errors in Brackets. I Subdomain: Pub Sample

	c	pm	pc
a	2,704 (0,225)	0,0	0,0
b	0,0	0,130 (0,129)	-0,182 (0,174)
B	0,0	0,0	0,0

TABLE 134

Matrix Φ of Exogenous Factor Intercorrelations, Fishbein-Ajzen Model. Standard Errors in Brackets. I Subdomain: Pub Sample

	c	pm	pc
c	1,000		
pm	0,691 (0,080)	1,000	
pc	0,822 (0,058)	0,813 (0,083)	1,000

TABLE 135

Diagonal of Ψ: Endogenous Factor Uniquenesses, Fishbein-Ajzen Model. Standard Errors in Brackets. I Subdomain: Pub Sample

a	b	B
0,022 (0,026)	0,022 (0,026)	0,022 (0,026)

TABLE 136

Matrices Θ_ε and Θ_δ of Manifest Variable Uniquenesses, Fishbein-Ajzen Model. Standard Errors in Brackets. I Subdomain: Pub Sample

	Θ_ε		Θ_δ
BII1	1,103 (0,133)	PCI1	0,948 (0,109)
BII2	1,062 (0,124)	PCI2	0,404 (0,118)
BII3	0,725 (0,088)	PCI3	0,601 (0,074)
BI1	0,166 (0,032)	PMI1	0,655 (0,081)
BI2	0,170 (0,025)	PMI2	0,562 (0,092)
TI	3,911 (0,503)	PMI3	0,678 (0,091)
LI	2,463 (0,406)	CI1	2,505 (0,290)
SDI	17,093 (2,297)	CI2	1,926 (0,237)
		CI3	2,242 (0,262)
		CI4	1,966 (0,239)

TABLE 137

Matrix Λ_y of Factor Loadings, Fishbein-Ajzen Model. Standard Errors in Brackets. R Subdomain: Pub Sample

	FACTORS		
Measures	a	b	B
BIR1	0,0	1,000 (0,0)	0,0
BIR2	0,0	0,724 (0,067)	0,0
BIR3	0,0	0,991 (0,073)	0,0
BR1	0,0	0,0	1,000 (0,0)
BR2	0,0	0,0	0,801 (0,087)
TR	1,000 (0,0)	0,0	0,0
LR	1,023 (0,060)	0,0	0,0
SDR	1,814 (0,107)	0,0	0,0

TABLE 138

Matrix Λ_x of Factor Loadings, Fishbein-Ajzen Model. Standard Errors in Brackets. R Subdomain: Pub Sample

	FACTORS		
Measures	c	pm	pc
PCR1	0,0	0,0	0,415 (0,087)
PCR2	0,0	0,0	0,599 (0,079)
PCR3	0,0	0,0	0,559 (0,081)
PMR1	0,0	0,444 (0,089)	0,0
PMR2	0,0	0,602 (0,082)	0,0
PMR3	0,0	0,677 (0,094)	0,0
CR1	0,617 (0,115)	0,0	0,0
CR2	0,945 (0,159)	0,0	0,0
CR3	0,544 (0,111)	0,0	0,0
CR4	1,267 (0,134)	0,0	0,0

TABLE 139

Matrix B of Regression Coefficients, Fishbein-Ajzen Model. Standard Errors in Brackets. R Subdomain: Pub Sample

	a	b	B
a	0,0	0,0	0,0
b	0,332 (0,093)	0,0	0,0
B	0,143 (0,055)	-0,096 (0,169)	0,0

TABLE 140

Matrix Γ of Regression Coefficients, Fishbein-Ajzen Model. Standard Errors in Brackets. R Subdomain: Pub Sample

	c	pm	pc
a	3,513 (0,242)	0,0	0,0
b	0,0	-0,047 (0,221)	-0,065 (0,476)
B	0,0	0,0	0,0

TABLE 141

Matrix Φ of Exogenous Factor Intercorrelations, Fishbein-Ajzen Model. Standard Errors in Brackets. R Subdomain: Pub Sample

	c	pm	pc
c	1,000		
pm	0,547 (0,082)	1,000	
pc	0,887 (0,064)	0,759 (0,103)	1,000

TABLE 142

Diagonal of Ψ: Endogenous Factor Uniquenesses, Fishbein-Ajzen Model. Standard Errors in Brackets. R Subdomain: Pub Sample

a	b	B
0,151 (0,029)	0,151 (0,029)	0,151 (0,029)

TABLE 143

Matrices Θ_ε and Θ_δ of Manifest Variable Uniquenesses, Fishbein-Ajzen Model. Standard Errors in Brackets. R Subdomain: Pub Sample

	Θ_ε		Θ_δ
BIR1	0,473 (0,072)	PCR1	0,874 (0,103)
BIR2	0,606 (0,077)	PCR2	0,544 (0,078)
BIR3	0,516 (0,077)	PCR3	0,623 (0,083)
BR1	0,128 (0,031)	PMR1	0,751 (0,096)
BR2	0,111 (0,022)	PMR2	0,452 (0,080)
TR	2,549 (0,397)	PMR3	0,605 (0,105)
LR	3,801 (0,532)	CR1	1,766 (0,203)
SDR	11,857 (1,662)	CR2	3,291 (0,379)
		CR3	1,660 (0,190)
		CR4	1,863 (0,223)

The results based on the Fishbein-Ajzen model will be discussed after the results based on the new model have been presented.

12.4 Results: New Model

In all applications of the new model, the following measurement uniquenesses were allowed to covary: PC1 and PM1; PC3 and PM3; C1 and C3. The same set of uniquenesses was allowed to covary in the applications of the Fishbein-Ajzen model. It was not necessary to constrain factor uniquenesses as these were positive in all cases.

Table 144 shows the χ^2 values, degrees of freedom, probability levels, GFI indices, AGFI indices and RMR indices for the E, I and R applications of the new model on the Priv data.

TABLE 144

Goodness-of-fit statistics of the New Model: Priv Sample

	E	I	R
χ^2	255,95	173,49	284,11
d.f.	123	123	123
p level	0,000	0,002	0,000
GFI index	0,448	0,678	0,567
AGFI index	0,232	0,552	0,398
RMR index	0,207	0,181	0,177

As the matrices are extremely large in the Bentler-Weeks parameterization, it would not be economical of space to reproduce them here in full. Instead, the free parameters will be presented in sets, each set containing conceptually related parameters. Reference to Figure 26 which depicts the model diagrammatically will facilitate comprehension of the tables. As usual, Priv results will be presented first (Tables 145-148).

TABLE 145

Loadings of Manifest Variables on Latent Variables, New Model. Standard Errors in Brackets. Priv Sample

		SUBDOMAIN		
Variable	Factor	E	I	R
BI1 (η_1)	b(η_{19})	1,000 (0,0)	1,000 (0,0)	1,000 (0,0)
BI2 (η_2)	b(η_{19})	1,456 (0,136)	0,836 (0,094)	0,809 (0,080)
BI3 (η_3)	b(η_{19})	1,023 (0,139)	0,758 (0,071)	1,362 (0,101)
B1 (η_4)	B(η_{20})	1,000 (0,0)	1,000 (0,0)	1,000 (0,0)
B2 (η_5)	B(η_{20})	0,898 (0,058)	1,006 (0,067)	0,837 (0,054)
T (η_6).	a(η_{21})	1,000 (0,0)	1,000 (0,0)	1,000 (0,0)
L (η_7)	a(η_{21})	0,781 (0,060)	0,949 (0,048)	0,893 (0,048)
SD (η_8)	a(η_{21})	1,531 (0,115)	1,777 (0,102)	1,685 (0,089)
PC1 (η_9)	pc(ξ_{23})	0,578 (0,065)	0,694 (0,078)	0,210 (0,074)
PC2 (η_{10})	pc(ξ_{23})	0,787 (0,070)	0,645 (0,066)	0,664 (0,070)
PC3 (η_{11})	pc(ξ_{23})	0,780 (0,060)	0,758 (0,071)	0,488 (0,072)
PM1 (η_{12})	pm(ξ_{24})	0,604 (0,060)	0,772 (0,086)	0,571 (0,080)
PM2 (η_{13})	pm(ξ_{24})	0,851 (0,081)	0,447 (0,056)	0,646 (0,071)
PM3 (η_{14})	pm(ξ_{24})	0,779 (0,060)	0,655 (0,080)	0,680 (0,076)
C1 (η_{15})	c(η_{22})	1,000 (0,0)	1,000 (0,0)	1,000 (0,0)
C2 (η_{16})	c(η_{22})	2,130 (0,784)	2,779 (0,794)	2,350 (0,505)
C3 (η_{17})	c(η_{22})	3,562 (1,167)	2,385 (0,678)	1,194 (0,254)
C4 (η_{18})	c(η_{22})	0,902 (0,430)	1,822 (0,551)	2,137 (0,449)

TABLE 146

Regression Coefficients of Latent Variables, New Model. Standard Errors in Brackets. Priv Sample

	SUBDOMAIN		
Struc. Link	E	I	R
a d ($\gamma_{21\ 25}$)	3,231 (0,253)	3,343 (0,238)	3,640 (0,252)
b d ($\gamma_{19\ 25}$)	0,659 (0,063)	1,021 (0,090)	0,882 (0,077)
c d ($\gamma_{22\ 25}$)	0,445 (0,146)	0,537 (0,153)	0,614 (0,123)
B d ($\gamma_{20\ 25}$)	0,461 (0,080)	0,266 (0,096)	0,470 (0,077)
B pc ($\gamma_{20\ 23}$)	-0,034 (0,075)	0,090 (0,086)	-0,005 (0,087)
B pm ($\gamma_{20\ 24}$)	0,002 (0,055)	0,116 (0,061)	0,045 (0,058)

TABLE 147

Correlations Amongst ξ Latent Variables, New 1. Standard Errors in Brackets. Priv Sample

	SUBDOMAIN		
Correlation	E	I	R
pcxpm ($\phi_{23\ 24}$)	0,662 (0,057)	0,690 (0,072)	0,625 (0,086)
pcxd ($\phi_{23\ 25}$)	0,789 (0,043)	0,863 (0,039)	0,780 (0,063)
pmxd ($\phi_{24\ 25}$)	0,662 (0,056)	0,758 (0,056)	0,603 (0,067)

TABLE 148

Manifest Variable and Latent Variable Uniquenesses, New Model. Priv Sample

	SUBDOMAIN		
Variable	E	I	R
BI1 (η_1)	0,395	0,795	0,558
BI2 (η_2)	0,391	0,925	0,463
BI3 (η_3)	0,935	0,379	0,246
B1 (η_4)	0,065	0,074	0,064
B2 (η_5)	0,047	0,064	0,070
T (η_6)	3,606	2,525	2,859
L (η_7)	4,004	2,082	2,900
SD (η_8)	14,311	12,013	9,431
PC1 (η_9)	0,487	0,658	0,710
PC2 (η_{10})	0,419	0,417	0,272
PC3 (η_{11})	0,216	0,438	0,570
PM1 (η_{12})	0,370	0,664	0,654
PM2 (η_{13})	0,595	0,309	0,395
PM3 (η_{14})	0,211	0,627	0,469
C1 (η_{15})	3,211	3,686	2,283
C2 (η_{16})	4,326	1,261	2,941
C3 (η_{17})	2,217	2,436	2,187
C4 (η_{18})	3,097	2,111	1,863
b (η_{19})	0,021	0,003	0,039
B (η_{20})	0,134	0,076	0,128
a (η_{21})	1,507	1,234	1,012
c (η_{22})	0,000	0,018	0,000

NOTE Standard Errors of uniquenesses are not available in the Bentler-Weeks parameterization using LISREL.

The goodness-of-fit statistics of the new model to the Pub data are given in Table 149.

TABLE 149

Goodness-of-fit statistics of the New Model: Pub Sample

	E	I	R
χ^2	163,69	181,03	139,02
d.f.	123	123	123
p level	0,008	0,001	0,153
GFI index	0,675	0,646	0,784
AGFI index	0,548	0,508	0,699
RMR index	0,186	0,195	0,122

The findings based on the Pub data will be presented in the same format used for reporting the Priv findings (Tables 150-153).

TABLE 150

Loadings of Manifest Variables on Latent Variables, New Model.
Standard Errors in Brackets. Pub Sample

		SUBDOMAIN		
Variable	Factor	E	I	R
BI1 (η_1)	b(η_{19})	1,000 (0,0)	1,000 (0,0)	1,000 (0,0)
BI2 (η_2)	b(η_{19})	1,335 (0,122)	0,735 (0,113)	0,740 (0,070)
BI3 (η_3)	b(η_{19})	1,211 (0,117)	0,842 (0,107)	1,011 (0,077)
B1 (η_4)	B(η_{20})	1,000 (0,0)	1,000 (0,0)	1,000 (0,0)
B2 (η_5)	B(η_{20})	0,771 (0,080)	0,811 (0,098)	0,809 (0,090)
T (η_6)	a(η_{21})	1,000 (0,0)	1,000 (0,0)	1,000 (0,0)
L (η_7)	a(η_{21})	0,839 (0,059)	1,271 (0,090)	1,024 (0,061)
SD (η_8)	a(η_{21})	1,604 (0,126)	2,385 (0,189)	1,819 (0,107)
PC1 (η_9)	pc(ξ_{23})	0,668 (0,084)	0,279 (0,086)	0,409 (0,087)
PC2 (η_{10})	pc(ξ_{23})	0,447 (0,065)	0,986 (0,093)	0,604 (0,079)
PC3 (η_{11})	pc(ξ_{23})	0,756 (0,080)	0,456 (0,073)	0,557 (0,080)
PM1 (η_{12})	pm(ξ_{24})	0,713 (0,082)	0,359 (0,079)	0,448 (0,088)
PM2 (η_{13})	pm(ξ_{24})	0,334 (0,083)	0,626 (0,088)	0,606 (0,081)
PM3 (η_{14})	pm(ξ_{24})	0,656 (0,082)	0,493 (0,085)	0,666 (0,093)
C1 (η_{15})	c(η_{22})	1,000 (0,0)	1,000 (0,0)	1,000 (0,0)
C2 (η_{16})	c(η_{22})	2,881 (1,143)	1,730 (0,279)	1,530 (0,363)
C3 (η_{17})	c(η_{22})	2,860 (1,019)	1,152 (0,177)	0,876 (0,215)
C4 (η_{18})	c(η_{22})	0,887 (0,460)	1,611 (0,265)	2,041 (0,404)

TABLE 151

Regression Coefficients of Latent Variables, New Model. Standard Errors in Brackets. Pub Sample

	SUBDOMAIN		
Struc. Link	E	I	R
a d ($\gamma_{21\ 25}$)	3,134 (0,249)	2,659 (0,228)	3,530 (0,245)
b d ($\gamma_{19\ 25}$)	0,845 (0,075)	0,951 (0,104)	1,082 (0,089)
c d ($\gamma_{22\ 25}$)	0,417 (0,158)	0,897 (0,141)	0,618 (0,115)
B d ($\gamma_{20\ 25}$)	0,688 (0,138)	0,586 (0,125)	0,550 (0,254)
B pc ($\gamma_{20\ 23}$)	-0,213 (0,118)	-0,345 (0,194)	-0,316 (0,529)
B pm ($\gamma_{20\ 24}$)	-0,077 (0,079)	0,202 (0,143)	0,229 (0,254)

TABLE 152

Correlations Amongst ξ Latent Variables, New Model. Standard Errors in Brackets. Pub Sample

	SUBDOMAIN		
Correlation	E	I	R
pcxpm ($\phi_{23\ 24}$)	0,591 (0,090)	0,807 (0,083)	0,765 (0,103)
pcxd ($\phi_{23\ 25}$)	0,824 (0,052)	0,817 (0,058)	0,876 (0,064)
pmxd ($\phi_{24\ 25}$)	0,697 (0,067)	0,697 (0,080)	0,530 (0,083)

TABLE 153

Manifest Variable and Latent Variable Uniquenesses, New Model. Pub Sample

	SUBDOMAIN		
Variable	E	I	R
BI1 (η_1)	0,450	1,119	0,501
BI2 (η_2)	0,683	1,062	0,608
BI3 (η_3)	0,722	0,693	0,527
B1 (η_4)	0,096	0,170	0,133
B2 (η_5)	0,132	0,169	0,103
T (η_6)	2,732	3,779	2,572
L (η_7)	3,323	2,393	3,810
SD (η_8)	17,405	16,524	11,758
PC1 (η_9)	0,635	0,958	0,880
PC2 (η_{10})	0,430	0,360	0,537
PC3 (η_{11})	0,476	0,606	0,625
PM1 (η_{12})	0,418	0,657	0,746
PM2 (η_{13})	0,744	0,549	0,447
PM3 (η_{14})	0,501	0,685	0,619
C1 (η_{15})	3,496	2,471	1,766
C2 (η_{16})	3,690	1,787	3,291
C3 (η_{17})	2,449	2,241	1,662
C4 (η_{18})	2,563	1,852	1,877
b (η_{19})	0,000	0,018	0,105
B (η_{20})	0,094	0,050	0,151
a (η_{21})	1,532	0,420	0,000
c (η_{22})	0,000	0,038	0,000

NOTE Standard Errors of uniquenesses are not available in the Bentler-Weeks parameterization using LISREL.

12.5 Discussion of Causal Models

We shall discuss the models under the following headings: overall fit; measurement parameters; and structural parameters.

12.5.1 Overall fit

The fits obtained under the two models are quite remarkably similar. The χ^2 values are comparable since the number of degrees of freedom are almost the same in all analyses: either 123 or 125. The following are the χ^2 values for the two models in the Priv sample (the first value of each pair refers to the Fishbein-Ajzen model and the second to the new model). E: 254,85, 255,95; I: 180,23, 173,49; R:

273,82, 284,11. Comparable values in the Pub sample are the following. E: 163,60, 163,69; I: 181,84, 181,03; R: 141,92, 139,02. The GFI and AGFI indices are also very similar for the two models. The RMR indices of the Fishbein-Ajzen model tend to be lower to a marginal extent.

Hence, in terms of overall goodness-of-fit, the two models cannot be distinguished; none of the above-cited indices offers any support for Postulate 4. The implications of this will be examined in the next chapter.

Consistent with findings on the disposition model, the fit for the Priv sample was poorer than that for the Pub sample. The fit for the two samples in the I subdomain was about the same, however.

In all the analyses, the following uniquenesses were allowed to covary: PM1xPC1; PM3xPC3 and C1xC3. This was done for the following reasons: in most of the analyses, high modification indices for the above parameters were found, indicating that the fit would improve substantially if they were freed; secondly, it was decided to free the same parameters in all analyses for the sake of consistency. There are other parameters which justifiably could be freed, but which do not have high modification indices in all analyses. There are also parameters which have high modification indices but which cannot be freed because this would result in the model not being fully identified. For instance, all correlations between uniquenesses cannot be estimated if PM1xPC1, PM2xPC2 and PM3xPC3 are freed simultaneously. For that reason, only PM1xPC1 and PM3xPC3 were freed, but there were high modification indices for PM2xPC2 in all analyses.

Inspection of the matrices of modification indices for the twelve analyses reported in this chapter indicates the following. In the Priv sample there are several high modification indices in each analysis but most of these involve parameters which cannot be freed justifiably. Almost all high modification indices involve correlations between uniquenesses. Freeing parameters of this kind is unjustifiable if the manifest variables in question do not have a common format. In the Pub sample, however, there are parameters which could be freed justifiably, resulting in a significant improvement in fit. Table 154 presents these. All are correlations between uniquenesses which were fixed at zero in the analyses reported in this chapter.

TABLE 154

Uniquenesses which, if allowed to Covary, would Improve the Fit of the Causal Models: Pub Sample

MODEL	SUBDOMAIN	UNIQUENESS COVARIANCE PARAMETER	MODIFICATION INDEX
Fishbein-Ajzen	E	PCE2xPME2	35,007
Fishbein-Ajzen	I	BII1xBII2	7,657
Fishbein-Ajzen	I	PCI2xPMI2	10,356
Fishbein-Ajzen	R	PCR2xPMR2	8,197
New	E	PCE2XPME2	36,315
New	I	BII1xBII2	8,163
New	I	PCI1xPMI2	9,396
New	R	PCR2xPMR2	8,413

Modification indices in excess of 5 indicate that freeing the parameter in question is likely to improve the fit of the model. Here a stricter criterion was used: only those modification indices in excess of 7 were identified.

The parameters listed in Table 154 have very similar modification indices under the two models. This is not surprising, as all these parameters are from the measurement submodels, which are the same for the two models. (All differences between the two models concern structural parameters.)

The modification index indicates the value by which the χ^2 statistic is likely to drop if the parameter in question were freed. Inspection of Table 154 indicates that both the Fishbein-Ajzen and the new model would fit the Pub data well in the E and R subdomains if additional parameters were freed. (The models fit the data reasonably in the R subdomain even without freeing additional parameters.) In the I subdomain, freeing the additional parameters would probably produce a borderline fit to the data in both models.

It seems, then, that both the Fishbein-Ajzen and the new models explain the data well in the Pub sample. Neither model accounts for the data adequately in the Priv sample. In this sample, the fit of the model in the E and R subdomain could be improved by allowing certain uniquenesses to covary, but in both these subdomains the χ^2 statistic is so high that no justifiable modification of the measurement submodel would result in a nonsignificant overall goodness-of-fit value. In the I subdomain, there are no justifiable modifications which would improve the fit significantly.

In both models and both samples, high modification indices are absent in the structural submodel: all are in the measurement submodel. In the Priv but not the Pub data, there are some unexpected high modification indices for fixed measurement parameters (e.g., for the correlation between the uniquenesses of PCI2 and CI1 in both the Fishbein-Ajzen and new models). This suggests that the Priv subjects associated the manifest variables less clearly with the underlying intended constructs that did the Pub subjects. Other constructs might have been more appropriate in accounting for the data in the Priv sample, although it is not clear what these constructs would be. Inspection of the residual matrices of all six Priv analyses (three based on Fishbein-Ajzen model and three based on the new model) reveals a somewhat larger participation of social pressure and cognitive/consequences variables in high residuals than attitudinal, conative and behavioural variables. It seems likely, then, that both models failed to account for social pressure and consequences factors adequately in the Priv sample. (We have already seen from the analyses of the dispositional models that a one-factor structure for cognition is inadequate.) It is possibly significant that social pressure and consequences factors are less directly under control of the individual than affective, conative and behavioural factors. The former set of variables are more susceptible to environmental influence than the latter: it could be that limitations on the generality of behaviour prediction models are exercised by variables which are prone to influence by the prevailing matrix of events in the milieu of the group under study.

12.5.2 Measurement parameters

In the Fishbein-Ajzen model, affect, conation and behaviour are endogenous variables and cognition, coworker pressure and managerial pressure exogenous variables. In the new model, there are four endogenous and two exogenous variables: cognition is assigned an endogenous rather than exogenous status.

There are two ways of scaling exogenous variables in LISREL. Either the loading of one variable on each factor can be set to unity, or the diagonal elements of the Φ matrix can be set to unity. In the present study the latter course of action was adopted for the following two reasons. Firstly, Φ is more readily interpretable as a correlation rather than a covariance matrix; and secondly, standard errors can be derived for all factor loadings.

As cognition is exogenous in the Fishbein-Ajzen model and endogenous in the new model, rescaling is necessary to compare the loadings. Let us take the E subdomain of the Priv sample to illustrate the rescaling procedure. In the Fishbein-Ajzen model, the loading of CE1 is 0,487, whereas in the new model it is set to unity. In order to compare the CE2, CE3 and CE4 loadings in the two models, it is necessary to divide the Fishbein-Ajzen loadings by 0,487. The rescaled Fishbein-Ajzen loadings and new model loadings are presented below.

	Fishbein-Ajzen Model	New Model
CE1	1,000	1,000
CE2	2,000	2,130
CE3	3,298	3,562
CE4	0,934	0,902

Inspection of the loadings reveals that equivalent loadings are very similar in the two models. Across-sample comparisons also indicate a fairly high level of similarity for equivalent loadings.

The social pressure and cognition variables tend to have larger proportions of their variance in uniqueness than affective, behavioural and conative variables. Table 155 presents the average proportion of variance assigned to uniqueness for the six classes of variables (conation, behaviour, affect, coworker pressure, managerial pressure and cognition). These averages were derived from the analyses based on the new model. (Those based on the Fishbein-Ajzen model are very similar and consequently are omitted.)

TABLE 155

Average Proportion of Variance Assigned to Uniqueness for the Six Classes of Variables. New Model

	Priv Sample			Pub Sample		
Variable Class	E	I	R	E	I	R
Conation	0,471	0,459	0,324	0,455	0,580	0,345
Behaviour	0,160	0,203	0,179	0,317	0,431	0,308
Affect	0,308	0,187	0,186	0,287	0,260	0,206
Coworker Pressure	0,416	0,502	0,677	0,572	0,647	0,702
Management Pressure	0,402	0,577	0,554	0,619	0,725	0,640
Cognition	0,798	0,632	0,691	0,813	0,571	0,750

In both samples, the uniquenesses of the cognitive variables are particularly high, especially in the E subdomain. It appears that cognitive structures with regard to equality are complex and not effectively accounted for by a single latent variable. Behaviour uniquenesses are lower in the Priv sample than the Pub, possibly because Priv subjects were more intensely exposed to Black advancement programmes: they were therefore surer of their behavioural responses.

The relatively high proportion of variance assigned to uniqueness in the cognitive and social pressure variables might be related to the environmental influence issue mentioned previously: constructs heavily susceptible to environmental influence are more likely to have complex structures. Dissonance reducing mechanisms (which tend to simplify constructs by removing or modifying elements of incompatibility) are less likely to be applied intensively to constructs which are strongly influenced by environmental events, because to do so would ultimately result in the loss of reality contact.

12.5.3 Structural parameters

We shall discuss the findings based on the Fishbein-Ajzen model first.

In all analyses the regression coefficient of the affect factor on the cognitive factor is highly significant. This is in line with the theory's prediction that attitude emerges from cognitive considerations. One should not over-interpret this result, however. Regression coefficients are often of comparable strength in both directions. It is not unlikely that a link in the reverse direction (i.e., from attitude to cognition) also would be highly significant. It will be remembered from Chapter 1 that caveats were expressed about the dangers of uncritically inferring causality. One must be especially careful in interpreting regression coefficients between exogenous and endogenous variables. An exogenous variable might appear to have a strong causal influence on other variables but this effect might have been spuriously inflated by the incompleteness of the hypothesized causal network. In a strict sense, this problem appears to be insurmountable; all variables have causal antecedents, hence all "exogenous" variables are really endogenous; a model is inescapably incomplete at the "edge".

The causal link from attitude to conation is significant in all subdomains, but the causal links from conation to behaviour and from attitude to behaviour are significant only in some cases. The strength of the attitude-behaviour and conation-behaviour links fluctuate from analysis to analysis apparently because there are two routes along which attitude can influence behaviour: directly, or via conation. This speculation was subjected to empirical examination in the I subdomain of the Pub sample. Under the standard Fishbein-Ajzen model, both the attitude-behaviour and the conation behaviour links are non-significant. Two modifications of the standard model were made: one involved the removal of the attitude-behaviour link and the other the removal of the conation-behaviour link. Under the former modification, the regression coefficient of behaviour on conation was estimated as 0,446 with a standard error of 0,056. Under the latter, the regression coefficient of behaviour on attitude was estimated as 0,159 with a standard error of 0,018. The two restricted models fitted the data equally well and almost as well as the original model.

It seems, then, that it is not necessary to have a direct and an indirect link from attitude to behaviour. One link will suffice.

The causal links from the social pressure variables are significant only in isolated cases. Discussion of the implications of this will be reserved until the findings of the new model have been discussed.

The new model consists of a disposition submodel and a behaviour prediction submodel. The strength of the structural links in the dispositional submodel are highly comparable to those obtained in the analysis of the single-disposition model (see Chapter 11). The regression coefficient of behaviour on the second-order disposition factor is significant in all analyses. Of the social pressure links with behaviour, none is significant and one only even approaches significance. The new and the Fishbein-Ajzen models differ in that social pressure is hypothesized to influence behaviour in the former and behavioural intention in the latter. In neither of the two models has evidence emerged of a strong social pressure influence on conative or behavioural phenomena.

Research has shown that the relative importance of attitudinal and social pressure variables in prediction exercises fluctuates from content area to content area; it is unusual, however, for the contribution of social pressure to be non-significant. The present research is probably unique in that a highly salient issue was selected for study in a working population (this contrasts with the usual practice of studying rather trivial attitudes in a student population). Hence, there are at least two factors which must be considered when interpreting the current findings: salience and population. It is possible that attitude is a very powerful predictor in highly salient content areas because the individual sees the issues at stake to have a strong influence on his future well-being. It is also possible that working individuals tend to incorporate social pressure influences into their attitudinal orientation more than students. All variables in this study are quite highly correlated, as examination of the Φ matrices and the matrices in Appendices I to IV reveal. Estimates of the correlation between the two social pressure factors vary between about 0,6 and 0,8. Correlations between the social pressure scales and the attitude scales are also substantial. It is conceivable that working individuals attempt to integrate their personal attitudes (or at least their expressed attitudes) with those of their reference groups to a greater extent than students. If this is the case, a more successful causal mode might be one in which pressure variables influence attitude rather than conation or behaviour.

13.0 GENERAL DISCUSSION OF RESULTS

Findings have been discussed in each results chapter. In this chapter, an attempt will be made to summarize and integrate the findings, to high-light the main results and to interpret these on theoretical and empirical grounds. In some cases, findings will be interpreted at a higher level of generality than was attempted in previous chapters, with the aim of drawing together and integrating different strands of the research.

The results can be discussed quite conveniently under four themes: the new attitude measurement methodology; structure of the attitude domains; the disposition models; and behaviour prediction models.

13.1 The New Attitude Measurement Methodology

The new attitude measurement methodology was submitted to rigorous examination. Although the findings did not show the new methodology to be dramatically superior to the other methodologies on any criterion, it did creditably on all counts, and on some indices showed signs of being marginally better than the competing methodologies. In discriminant analyses in which all attitude measurement techniques were entered, the T methodology was selected in preference to the other methodologies in most cases. In analyses in which only one attitude methodology was entered, prediction sets incorporating the T methodology typically produced the best or second-best classification and multiple correlation with the criterion.

In terms of reliability and variance, T scales were similar to their L counterparts although they usually had slightly more variance than these. The level of reliability of T scales is creditable considering the situation-specific and varied nature of their stimulus material. SD scales were more reliable and had more variance than T or L scales, apparently because they have more response alternatives and a simple homogeneous item format. An acceptable level of reliability is a necessary requirement for a measuring instrument, but high reliability per se is no guarantee that the instrument taps an intended latent construct in a superior fashion. Although SD scales had extremely high reliabilities as estimated by coefficient alpha, this did not translate into correspondingly impressive predictive or construct validity. Here the T scales seemed to have a slight edge, as is illustrated in Table 156 which lists the proportions of unique variance for the T, L and SD measures in the Fishbein-Ajzen and new causal models.

TABLE 156

Proportions of Unique Variance for the Attitude Scales in the Causal Models

		Fishbein-Ajzen Model			New Model		
Scale	Sample	E	I	R	E	I	R
T	Priv	0,241	0,179	0,174	0,232	0,170	0,167
L	Priv	0,361	0,167	0,196	0,354	0,157	0,203
SD	Priv	0,335	0,226	0,186	0,338	0,235	0,189
T	Pub	0,210	0,347	0,170	0,194	0,335	0,171
L	Pub	0,298	0,170	0,225	0,293	0,165	0,226
SD	Pub	0,375	0,289	0,223	0,373	0,279	0,222

In both samples and both models, the T scales had the lowest proportion of unique variance in the E and R subdomains; the L scales had the lowest in the I subdomain. Hence, despite the fact that the SD scales had the smallest standard errors of measurement of the three methodologies, they tended to have relatively high uniquenesses in comparison with T and L scales.

A large difference was found between methodologies in the comprehensibility of instructions. Approximately 10% of protocols had to be discarded due to omissions and other errors in answering SD scales, caused by misunderstanding of instructions. In the T and L scales, on the other hand, almost all subjects responded correctly to all items.

Two variations in the method of scoring T scales were tried. In one, the extremity and intensity scores were multiplied, and in the second, T scores were divided by the sum of the internal standard deviation and a constant. Neither variation improved the behaviour prediction power of the T scales over that obtained using simple extremity scores. The intensity and internal sd scores apparently contained no extra information beyond that contained in the extremity scores.

Although dividing extremity scores by internal sd failed to improve prediction in this study, the possibility exists that this might be more successful in other studies. It is therefore worth trying the transformation on other data before discarding it as worthless.

Two advantages of the T methodology are that it appears to measure on a ratio scale and that its stimulus material is neutral. The former characteristic makes it possible to assess both the direction and extremity of individuals' attitudes; the latter reduces agreement response set and frees T scales from the shortcoming suffered by L and other scales of having the proclivity to break into two subscales based on the direction of the stimulus material. This fault was experienced with the consequences scales which had a bipolar method factor, apparently caused by the directional nature of the item statements (see Chapter 11).

T scales have now been administered on four occasions and in two distinct content domains: job satisfaction and Black advancement. In the job satisfaction research, which was in effect a pilot study for the research reported in this thesis, a semi-projective format was used for the T methodology. Subjects had to project themselves into an imaginary character who was the main actor in the situations described in the items. A problem was found with this format: individuals did not always project themselves fully into the imaginary character. In subsequent administrations of the T methodology (i.e., in the Black advancement administrations) the projective element was removed, and the methodology performed in a very satisfactory fashion. The administrations were all to literate White subjects. The performance of the methodology should now be examined on other race groups and on less literate people. In order to make it usable on people with low literacy levels, some modifications to the administration procedure will be necessary (e.g., verbal presentation of item material, and possibly the reduction of response alternatives from five to three). It is felt that the concrete nature of the stimulus material and its neutrality makes the methodology well-suited to applications in the Third World. Morris and van der Reis (1980) administered a number of different types of attitude scales to Blacks in order to assess their feelings about certain transport issues. They concluded that verbal, as opposed to pictorial and spatial scales were the most valid and reliable, and that it was difficult to find vernacular equivalents for more than about three levels of emotional or evaluative response. It appeared that anchoring the items in more concrete material would have been advantageous. These findings suggest that the T methodology might be used with success on Blacks with low levels of literacy.

13.2 Structure of the Attitude Domains

Three subdomains were hypothesized in the Black advancement attitudinal domain: equality, integration and responsibility. A rational evaluation of the content area and an analysis of actual events which have had an impact on Black advancement guided the author in his conception of the structure of this domain.

Both structures were confirmed under additive and multiplicative models. Under the additive model, manifest scores were hypothesized to be the weighted sum of relevant trait and method factor scores plus uniqueness; under the multiplicative model, manifest scores were hypothesized to be the sum of the product of common score trait and method influences and uniqueness.

Although the two models cannot be compared directly on all counts, it is possible to compare overall goodness-of-fit, trait intercorrelations, method intercorrelations and residuals. On these criteria, the results obtained under the additive and multiplicative models were quite similar, although there were minor differences, especially in fit: multiplicative model fits were poorer.

Both models estimated trait intercorrelations to be in the 0,85 to 0,95 range in both samples. Method intercorrelations were also high under both models (generally above 0,8), with the multiplicative model tending to estimate slightly higher values than the additive model. The T and L methods were more highly correlated with each other than with the SD method under both models.

The additive and multiplicative confirmatory MTMM analyses gave useful information on two aspects of the study. Firstly, they established the convergent and discriminant validity of the subdomains, and gave an indication of the degree of interrelationship among the subdomains. Secondly, they provided a number of indices on which the performance of the attitude scales could be judged. These indices showed that the affect scales were performing satisfactorily.

Browne's (1983) multiplicative model is suitable only for MTMM data. All the more elaborate analyses executed in this study used additive models only. It is encouraging that both additive and multiplicative models produced such similar results in the MTMM analyses. Multiplicative MTMM models are arguably superior to additive models (Campbell and O'Connell, 1967; Browne, 1983). Certain aspects of the more elaborate structures examined in this study could have been modelled to interact multiplicatively, but no general procedure exists at this time to analyze such models the way Browne's does for MTMM data. However, the similarity of the additive and multiplicative results in the simpler MTMM model leads one to hope that comparably similar results would have been obtained for the more elaborate structures.

The relationships between sets of scores are sometimes fairly linear in the mid-ranges: non-linearity becomes apparent only at the extremes. If the data under study is mainly in the reasonably linear mid-range, then additive and multiplicative models might produce quite comparable results. This could be the case in the present study.

13.3 The Disposition Models

Two disposition models were examined in this study: a single-disposition structure and a three-disposition (multiple-disposition) structure which also incorporated method factors.

In Chapter 6 the point was made that the tripartite theory has previously not been investigated rigorously, even by those researchers applying confirmatory techniques. Unfortunately, the original theorists who developed the tripartite theory have not described it in sufficiently precise and metric terms to allow a straightforward translation of the theory into a set of structural equations. Researchers using latent structure confirmatory methods to investigate the tripartite theory have posited a first-order structure in which the three components are allowed to correlate. The choice of the first-order model was possibly an expedient one, resulting from the ready availability and easy parameterization of first-order confirmatory models. In the opinion of the present author; the first-order tripartite model is inadequate: confirmation of the model establishes the integrity of the cognitive, conative and affective factors, but not the structure as a whole. In order to investigate the adequacy of the feeling-thinking-striving dispositional (or "attitudinal", as it is generally known) construct, a second-order model is required.

A second-order model hypothesizes that the common variance among first-order factors can be accounted for in a single higher-order factor. This has implications for dissonance theory. The second-order factor represents the resolution of differences amongst the first-order factors. Greenwald (1968) theorizes that the affective, conative and cognitive components are formed in different ways: the affective through classical conditioning, the conative through operant conditioning and the cognitive through exposure to information. (This is in contrast to the Fishbein-Ajzen theory which sees exposure to information as the basis for affective and conative responses.) If the three components are formed in such diverse ways as Greenwald believes, then the second-order disposition factor may be interpreted as one of the products of self-awareness: through a process of self-scanning and reasoning, anomalies are identified and resolved at a higher conceptual level.

The multiple-disposition model investigates the tripartite structure even more rigorously than the single-disposition model. This model enables the researcher to test the integrity of each dispositional structure in the context of similar closely related structures.

In the multiple-disposition model, there are many possible structural links but only a small number of actual links. For instance, there are no direct links between corresponding factors of different dispositions. The ratio of fixed parameters to free parameters is very high in this model (of the order of 10:1 as opposed to about 4:1 in the single-disposition model). Hence, the multiple-disposition model is highly constrained, a desirable attribute from a scientific point of view, as it makes strong statements about the structure of the data and is "open" to rejection on many counts.

Method factors were included in the three-disposition model in order to accommodate the unfortunate shortcoming of psychological measurement: that the nature or format of a measuring instrument almost invariably influences scores quite considerably. No measuring instrument, even in exact sciences like physics, is ever completely "transparent": scores are "coloured" by the way they are measured. In psychology, however, the problem is severe. The present author does not know of a study involving the measurement of different constructs using the same methods where the goodness-of-fit has not been improved substantially by incorporating method factors.

The single-disposition model proved to fit the data adequately in the Pub sample, but not in the Priv. Inspection of the residual matrices of the Priv analyses revealed that many high residuals involved cognitive variables. In the E and R subdomains there was a large representation of high cognition x conation residuals. In the I subdomain, where the fit failed to reach the 0,05 probability level by only a small margin, there were a few high cognition x affect residuals. These findings suggest that the first-order constructs, particularly the cognitive and conative constructs, were multidimensional or inappropriately defined in the Priv sample.

In addition, it was found that the cognitive measures had high uniquenesses in both samples. This was not altogether surprising, as the cognitive scales had low internal consistencies. It seems that individuals' cognitive responses could not be modelled by a single factor. A more elaborate structure involving several interrelated factors appears to be required. Also, the structure may vary from group to group, or even individual to individual, to quite a substantial degree.

In elaborate models, there is a greater likelihood of measurement problems or structural misspecifications than in smaller models. Consequently, it is difficult to obtain a satisfactory fit to the data with a large model, even with one which has a sound basic structure. The main aim in the analysis of the multiple-disposition model was not to "get a fit" but to examine the adequacy of the model on a more detailed level.

Not surprisingly, the model proved to be much more adequate in accounting for the Pub. data than the Priv. In the Pub residual matrix, high residuals occurred frequently only in cells involving three variables. Inspection of the first-order derivatives and modification indices showed that there were no high values in the structural submodel, but a few in the measurement submodel. The parameters with high values were for the most part covariances between uniquenesses which had been set to zero. Hence, it seems that the three-disposition model was a reasonable one for the Pub data and that problems were predominanatly to do with measurement rather than structure.

Inspection of the residual matrix based on the Priv data revealed a situation consonant with that obtaining in the single-disposition analysis. There were many high residuals involving cognitive and conative variables, and it appeared that the cognitive and conative responses were not adequately modelled in the Priv sample.

In both samples, loadings on the method factors were generally substantial: hence method variance influenced scores quite significantly. The cognitive method factor was remarkable in that there were both positive and negative item loadings on this factor. Scrutiny of the relevant cognitive items revealed that there was an almost perfect correspondence between the direction of the item and the direction of the loading. This suggests that if an exploratory factor analysis were performed on the cognitive items, positive and negative items would load on separate factors.

In all analyses, both single-disposition and multiple-disposition, factor uniquenesses were generally small. In some cases, uniquenesses had to be constrained to zero in order to prevent them from becoming negative. Consequently, the links between the first- and second-order factors were very strong. It should be remembered, however that these strong links were between the second-order factor and the <u>common</u> variance of each set of construct measures. Much unique variance of the cognitive and conative measures was excluded from the structural submodel.

Let us consider a hypothetical model which is an elaboration of the second-order structure examined in this study. Suppose that more first-order cognitive (and possibly also conative) factors were modelled. A greater proportion of the variance of the manifest measures probably would have been absorbed into the latent structure. However, some of the regressions of the first-order factors on the second-order factor probably would have been moderate or low. Higher-order cognitive elements which integrate lower-order elements must perforce omit many specificities. The exclusion of specificity is essentially an information-reduction or concept formation task. Higher-order constructs simplify the mental space under consideration and facilitate information processing.

13.4 Behaviour Prediction Models

Two approaches were adopted in the behaviour prediction phase of this study. In one, a straight-forward regression approach was used and in the second, structural equation modelling.

Most behaviour prediction theorists base their work on a simple regression model (e.g., Fishbein and Ajzen, 1975; Triandis, 1977; and Rokeach, 1967). These models have two disadvantages. Firstly, manifest variables rather than latent variables are generally used as predictors; consequently, β-weights are distorted by the unreliability of the predictors, making these weights untrustworthy to use in future applications. Secondly, no account is taken of the causal interrelationships amongst predictor variables and no provision is made for models which have more than one dependent variable. Models based on a simple regression approach are not highly elaborated from a theoretical point of view.

Regression models are useful, however, if the intention is to adopt a "bottom line" approach. If the aim is to investigate the predictive power of an optimally weighted set of predictors, then the regression technique is useful. The interrelationships amongst variables are unimportant if one's only interest is to find a set of predictors and a corresponding set of weights which allows one to predict a criterion effectively (with as few errors as possible) and economically (with as few predictors as can be managed without losing a significant amount of power).

In this study, a stepwise regression approach was adopted, which facilitates the achievement of optimally effective and economical prediction for the variables under consideration. The procedure selects variables one by one, using as a criterion for selection the additional predictive power of the variables not yet selected. If a significant improvement in prediction cannot be achieved by admitting a new predictor, the selection procedure stops and the optimal set of weights is calculated to maximize classification accuracy.

Many variables were included as candidates for selection in the stepwise discriminant analyses performed in this study. The main ones were affect, cognition, coworker pressure and managerial pressure, but others such as within-scale standard deviation, attitudinal intensity and the product of extremity and willingness to comply with agents of social pressure were also included.

Many different analyses were performed, some involving the prediction of only two behavioural categories and some three. In the two-category positive-negative prediction exercise, the ratio of between-group to within-group variance was found to be highly significant for all the main predictors. In the other analyses, significant differences were found between groups for attitude in all cases, but there were isolated cases where group differences on pressure variables were not significant.

Overall, attitude emerged as the most powerful predictor. Only in one set of analyses (prediction of positive and negative behavioural category membership, I subdomain, Pub sample) was attitude not selected first in the stepwise procedure (cognition was selected first in this set). Social pressure variables were selected from time to time in both samples but did not add greatly to the accuracy of prediction. As all variables were quite highly correlated, second and third predictors entered into the discriminant function generally did not improve prediction dramatically; F-to-enter ratios tended to be modest after the first entry. Non-attitudinal variables sometimes carried substantial weights in discriminant functions, but when variables are strongly intercorrelated, weights are unstable.

In many studies, attitude is found to be a rather modest predictor of behaviour (see Chapter 5). The present research, however, has found attitude to be rather an effective predictor. Brannon et al. (1973) suggest that the strength of attitude-behaviour relationship is affected by the salience of the attitude object and the realism of the setting. Their attitude object was salient and the setting was in "real life" rather than the laboratory (homeowners' reactions to open housing versus owners' right was the attitudinal and behavioural domain studied). The same conditions prevail in the present study. Most attitude research, on the other hand, is performed on trivial issues in the laboratory. The salience of an issue, in particular, might have a significant impact on the strength of the attitude-behaviour relationship.

Although the discriminant functions were very effective in classifying individuals correctly into the positive and negative behavioural categories, correct classification into the neutral category was achieved with a far lower success rate. In particular, the correct classification of subjects into negative and neutral categories was achieved with a low level of success. Variables included in the study were not highly effective in distinguishing those individuals who were prepared to engage in overt negative behaviour from those who preferred to remain anonymous. It is possible that there were several individuals whose views were negative but who remained anonymous out of fear of victimization by management. The inclusion of a variable measuring the degree of this concern might have improved the accuracy of prediction, particularly of membership of the neutral category.

There might be two kinds of consequences variables which influence behaviour: perceived consequences of implementing Black advancement practices and perceived consequences of engaging in different types of behaviour with respect to Black advancement. The present study included only the former kind of consequences variable. One might call the former "general consequences" and the latter "personal consequences". Personal consequences might be particularly important in the prediction of behaviour in contexts where there is a strong authority structure or where the peer group has the power to influence the individual's well-being substantially.

In causal modelling, the focus is not so much on optimizing prediction as on examining the adequacy of a whole network of hypothesized causal interrelationships and covariances. The method forces the experimenter to state his hypotheses very precisely, and hence eliminates "fuzzy" theorizing. Both the overall adequacy of the model and its effectiveness in meeting specific criteria can be examined. The confirmation of a highly constrained model is scientifically of value because such a model accounts for the data parsimoniously. In cases where one model is nested in another model, it is possible to determine whether the less constrained model fits the data significantly better than the more constrained one. If the fits of the models do not differ significantly, there is a case for adopting the more constrained model because of its greater parsimony.

In the present study, the two models examined are not nested, so the above procedure cannot be applied. In terms of the number of parameters to be estimated, the two causal models are the same. However, the imposition of the second-order disposition factor in the new model makes the model highly constrained in this regard. The Fishbein-Ajzen model hypothesizes that the "internal" influence on behaviour comes from attitude; the new model, on the other hand, claims that this influence comes from a higher-level mental construct which represents an overall reaction to the issue in question and which has as specific manifestations affective, conative and cognitive responses. In the Fishbein-Ajzen model, cognition is exogenous and has an impact on affect, whereas in the new model, affect and cognition are endogenous and have no direct influence on any other factor. The models also differ in the hypothesized causal influence of the social pressure constructs. In the Fishbein-Ajzen model, these constructs influence conation, whereas in the new model, they influence behaviour itself.

The results showed that the effectiveness of the two models in accounting for the data was almost identical. Each model was applied six times: to the E, I and R subdomains in both samples. Hence there were six pairs of analyses where goodness-of-fit comparisons could be made. In all six pairs, the goodness-of-fit indices under the two models were highly comparable.

Another regularity in the findings was that both causal models accounted for the data quite well in the Pub data and both accounted for the data poorly in the Priv data. These findings lead us to ask two questions. How can two quite different models fit the data equally well? Why are the models better at accounting for the Pub data than the Priv? We shall try to answer these questions in turn.

Any model or theory is an approximation to the true state of affairs, as it tries to explain a set of events in a simplified fashion. Simplicity is seen as a virtue in science as it enables us to account for phenomena interacting in an apparently complex way by using only a few constructs and hypothesized interrelationships. Inevitably this virtue is also a flaw, because simplification involves disregarding discrepancies or possibly claiming that these are unimportant, or are due to measurement error, sampling problems, or some other supposedly trivial factor. The regularities which can be accounted for are emphasized and those which cannot be explained are "written off" as error or uniqueness. No theory or model can be "the truth", as was stated in Chapter 1. Theories can only be approximations to the truth (if we can even use the term "truth") and as such can be better or worse approximations. If two rather different theories account for the data equally well (or poorly) then this suggests that it should be possible to propound a third theory which will account for the data better than either of the original theories. This third theory will approximate the truth better than the first two.

These comments are also applicable to the second question, which asked why the models were more successful in accounting for the Pub data than the Priv. One of the ways in which a model can fail as a descriptor of observed events is by lacking universality: in some contexts its simplifications may cause its predictions to be inaccurate. It is therefore necessary that a theory be tested in many different applications in order to assess the range of conditions over which it approximates the observed state of affairs adequately.

In the present study we found an application where not one, but two, models failed to fit the observed data. This suggests that the weaknesses of the models are not to be found in their differences, but rather their similarities. A further helpful piece of information is that a substructure of one of the causal models also failed to fit the Priv data adequately. This substructure is the single-disposition model. It seems quite implausible to suggest that the poor fit of this model in the Priv sample was due to the fact that the affective, conative and cognitive constructs were not sufficiently closely related to form a second-order factor in this sample. The affective, conative and cognitive scales were intercorrelated to more-or-less the same degree in both samples. A comparative inspection of the residual matrices of the single-disposition model in the two samples indicated a larger representation in the Priv sample of high residuals involving cognitive variables.

This was also found in the two causal models; and in addition, there were more high residuals involving social pressure variables in the Priv sample. Other indices which suggested that the cognitive and social pressure domains had not been modelled adequately in the Priv sample were: high uniquenesses for items measuring these domains; several high modification indices involving cognitive and pressure measurement parameters; and relatively low reliabilities for the cognitive and pressure scales, as estimated by coefficient alpha.

It seems, then, that the structure of covariance hypothesized for the cognitive and social pressure variables was not able to account for the data adequately. For each manifest variable used in the causal models, variance was partitioned into two: that variance which the variable shared in common with other variables measuring a given construct and that which was either unique or error. It appears that there were regularities in the data which were not completely accounted for in the Priv sample by the hypothesized structural and measurement submodels. In both causal models, the cognitive, management pressure and coworker pressure domains were each represented by a single factor. These "factors" might have been composed of a network of interrelated factors; or they might have been defined inappropriately. Manifest variables which were modelled to measure the same factor might have been modelled more suitably to measure different factors; in some cases, measures might have had loadings on more than one factor.

There are two possible reasons why the causal models used in this study provided poorer fits for the Priv data than the Pub. Firstly, it is conceivable that the structures of the cognitive and pressure constructs were simpler in the Pub sample and hence more in line with the models tested. Secondly, it is possible that the Priv sample was more heterogeneous, and consequently that the inadequacies of the models showed up more dramatically in this sample. These two possibilities are not mutually exclusive: rather, they are compatible. Social pressure variables are "external", and so, in a sense, are cognitive phenomena. Both depend on input from the organizational and social milieu for their content and possibly their structure. Hence, the structure of pressure and cognitive constructs might have been more elaborate in the Priv sample because there was a wider variety of individuals employed in the Priv organization than the Pub.

In the Fishbein-Ajzen model, the social pressure constructs were hypothesized to influence behavioural intention and in the new model, behaviour. In both models the social pressure links proved to be non-significant in most cases. This is a somewhat unexpected finding, as social pressure variables are generally found to have a substantial impact on conation or behaviour in most studies. There are several possible explanations for this. Four of the more plausible ones are listed below.

(i) The pressure constructs, as modelled, were too simple to account for the social pressure domain; causal links with conation and behaviour were consequently weak.

(ii) Social pressure and "internal" (dispositional) factors might not be clearly distinguished in working groups. Individuals might internalize social pressure influence to the point that no extra predictive power is added by "external" factors.

(iii) Social pressure might influence some factor other than conation or behaviour in working groups. The opinions of coworkers and management might have an impact on the way the individual cognitively evaluates the issue or the way he affectively evaluates it.

(iv) Social pressure influences might be relatively unimportant for issues which are highly salient.

All these possibilities have implications for behaviour prediction theory. Further research is required to investigate them.

14.0 CONCLUSION

This research has produced a new measurement procedure, findings relevant to theory and directions for future research.

The attitude measurement methodology has been applied to two samples in this study and two different samples in another (as yet unpublished) study which investigated job satisfaction. In both studies, the new methodology was compared with other widely-used methodologies on a number of criteria. These criteria included omission ratio; coefficient alpha; ρ_h (reliability index obtained under the multiplicative MTMM model); predictive power in discriminant functions; loadings on an affective factor; uniqueness; and residuals under affective, dispositional and causal models. It can be said with confidence, therefore, that the new methodology has been thoroughly researched.

On almost all criteria, the performance of the methodology has emerged as being as good as, or slightly better than, the competing methodologies. The only criterion on which it is distinctly bested is on reliability: here the Semantic Differential achieves higher values. The higher reliability of the Semantic Differential does not translate into higher predictive power, however; it seems that much of the Semantic Differential's variance is method variance.

Most widely used methodologies are very abstract in content and mode of presentation. In the Likert methodology, for instance, the stimulus material consists of statements about the attitude object and the response alternatives consist of levels of agreement and disagreement with the statement. The subject has to deal with two abstract continua: the degree of extremity of the statement and the degree of extremity of the response. In the Semantic Differential methodology, the stimulus material consists of abstract adjectives and the response alternatives are segments of a continuum; the number of segments into which the continuum is divided is arbitrary, and the boundaries of the segments have no special characteristics to distinguish them.

Individuals educated in the Western tradition are reasonably comfortable with abstract concepts. People who have not had the benefit of much formal Western education often seem to have difficulty with abstractions, or at least the kinds of abstractions which are made in Western thought. It seems desirable, therefore, to use concrete stimulus material wherever possible when assessing the psychological attributes of relatively uneducated people. The stimulus material can be highly concrete in the T methodology. Specific people and events which are familiar to the respondent can be included as an embedding context.

The technique can be used to express different points of view through the words or thoughts of different individuals. In a simple case, there are only two individuals expressing diametrically opposed views. Items of this kind were included in the T scales used in this study. More elaborate situations may be portrayed using the T methodology where more than two individuals state their views. The subject would respond by agreeing with one of the actors. A format of this kind would depart from the simple positive-negative way of dimensionalizing attitude. It is possible that the practice of imposing a positive-negative continuum on attitudinal material is more in keeping with Western thought processes than with the thought processes of people with different cultural heritages. The reduction of information into simplified schemata is highly valued in the West. This way of handling information is very useful in science: specificities may be deliberately overlooked in exchange for an economical and "useful" way of structuring information. Other cultures may place less of a premium on information reduction than the Western culture. In the attitudinal domain, this might manifest itself in more complex structures than can be accommodated in the positive-negative dimensionalization. The T methodology can accommodate this.

We shift our attention now to the research findings. This study adopted what might be called a "broad" approach to the examination of measurement methodology and structural models. Three content subdomains were studied and data on two samples were collected; two causal models were investigated. This broad approach had at least two advantages.

Firstly, it created a "context" in which the research can be evaluated more effectively. Most researchers study a single content area: as a result, they are unable to examine mental structures in a meaningful way. Compare, for instance, the simple first-order affective-conative-cognitive structure examined by Bagozzi (1978) with the second-order multiple-disposition model investigated in this study. A given structure can be studied more rigorously if it is studied in the context of other related structures. As a result of this approach, it was possible to establish that the dispositional structure retained its integrity when embedded in a context of other closely-related dispositional structures. Although the modelled dispositional structure appeared to be an over-simplification of the "true" dispositional structure, no evidence came to light in the multiple-disposition analysis that the structure was fundamentally wrong.

Secondly, the adoption of the broad approach permitted hypotheses to be tested in several sets of data and content domains. Suppose that a much more restricted study had been mounted and that only the single-disposition model and new causal model had been studied in the R subdomain on Pub data. The conclusion would have been that both these models worked well: it would have been tempting to assume that the Fishbein-Ajzen model would not have worked as well and that the models studied would have worked well in other samples also. By adopting a broader approach we have learned more about the shortcomings of the models and the relative merits of competing models.

The additive and multiplicative MTMM models, which incorporated only affective variables, described the data well. Affective constructs might be the easiest to model because of their simple nature. Affect is a characteristic which higher mammals share in more or less full measure with man; cognitive structures, on the other hand, are much more highly developed in humans. A strong case can be made for seeing affect as a more primitive, simpler, phenomenon than cognition. Affective responses have their main centre in the limbic system of the brain, phylogenetically an older structure than the frontal cortex, which performs much of the cognitive processing. (Conative and most behavioural events are also processed in the frontal part of the cortex.) The affective model was a simple first-order three-factor model with intercorrelations permitted among the factors. The three factors represented emotional reactions to related content subdomains. Convergent and discriminant validity were demonstrated for the subdomains in both applications. Under both the additive and multiplicative models, high intercorrelations were estimated among the three subdomains. A one-factor model failed to describe the data adequately in both content domains. Hence, individuals' emotional responses to equality, integration and responsibility were related but distinct. This would indicate that even on the emotional level quite fine discriminations are made.

The disposition model proved to account less successfully for the observed data than the purely affective model. The first-order factors of the disposition model are affective, conative and cognitive. Although the model was able to account for the Pub data sufficiently well to produce reasonable fits in the E, I and R subdomains, there were indications even in this sample that the model was not perfectly satisfactory. In the Priv data, where the fits were poor, evidence of the inadequacy of the model was stronger. The main weakness of the model appeared to be in the way it accounts for cognition. Large uniquenesses for cognitive variables and high residuals for covariances involving these variables suggested that a more elaborate cognitive structure should have been modelled. The inadequacy of the disposition model possibly emerged more strongly in the Priv sample because this sample was more heterogeneous than the Pub sample. The complexity of the cognitive domain emerged more fully in a sample where a wide variety of opinions were held and where individuals were exposed to a wide spectrum of beliefs about Black advancement. This heterogeneity might have been fostered by the implementation of Black advancement practices at different rates in different parts of the organization.

In Chapter 2, mention was made of a number of characteristics of attitude which have been cited in the literature. One of these was multiplexity. The comment was made that this characteristic might be more relevant to the cognitive than to the affective component. The findings have borne out this speculation. The results show that cognitive responses are not sufficiently highly correlated to make it possible to model these with one dimension. It seems that multiplexity implies multidimensionality in the cognitive domain.

Both causal models also proved to have inadequacies, again more clearly seen in the Priv sample. The residual matrix can be used as a diagnostic instrument to determine where the greatest errors are being made in the reproduction of observed covariances and hence what parts of the model appear to be inadequate. In both causal models, substantial numbers of cognitive and social pressure covariates had high residuals, indicating that these constructs were not modelled satisfactorily. Perceived social pressure is a largely cognitive phenomenon. Although social pressure is regarded as an "external" factor in behaviour prediction theory, it is only once the pressure has been apprehended and internalized that it can play a role in behaviour prediction. The perceived consequences of social pressure is represented mentally as a network of beliefs which models the external social structure. In a social or organizational context which is heterogeneous or composed of a number of substructures, the individual's perception of social pressure is likely to be correspondingly complex.

The social pressure domain in the present study was divided into two categories: that emanating from management and that emanating from coworkers. It seems that these categories were too crude, especially in the Priv sample, to model the domain adequately. Coworkers may be quite a heterogeneous group of people. This group could be subdivided into a number of smaller and more homogeneous groups (e.g., work friends, coworkers of the same rank, coworkers whom one sees on a daily basis). Similarly, management could be subdivided into a number of levels of management, ranging from one's immediate supervisor to top management. The strengths of the causal influences of these factors on conation or behaviour would indicate the sources of powerful social pressure on particular groups of people in a given organization.

Just as the cognitions of social pressure appear to be influenced by the structure and content of the milieu, the cognitions of perceived consequences are similarly likely to be influenced by these factors. In a heterogeneous context where many differing beliefs are held about the consequences of implementing a particular course of action and where many different events relevant to the issue are occurring, the structure of beliefs is likely to be complex, whereas in a homogeneous context, the structure is likely to be simpler.

We come now to directions for future research. As far as the use of the new attitude measurement methodology is concerned, there is a clear avenue for future research. The technique should be tried on groups other than Whites and on individuals with low levels of education. Some modifications to the item structure and mode of presentation might be necessary. For people with very low levels of education, it will probably be advantageous to reduce the number of response alternatives to three and it will be necessary to present the stimulus material verbally. Other possible modifications to the methodology have been discussed already. An effective way to validate the technique in non-Western cultures would be to apply it in conjunction with exploratory methods such as group discussions. Godsell (1983) has developed a group discussion method which she has used successfully to assess work values in Black samples. Being a flexible method, it can be employed effectively to map out the nature of the content domain and the major issues. It is expensive and time-consuming to apply on a large scale, however. Hence, it is preferable to use a cheaper, faster method in large surveys. Information on the content area could be used in the construction of T items. The T technique could be validated against the exploratory method by determining the degree to which the two instruments produce comparable results.

The disposition and causal models should be elaborated before they are applied in the future. In particular, attention should be paid to the restructuring of the cognitive and social pressure constructs. The research findings obtained in this study suggest that it might be naïve to expect that it is possible to construct a single causal model which will perform effectively in all behaviour prediction situations. The main structure of the model might be invariant but many details are liable to change from one application to the next. The structures of social pressure and cognitive variables are likely to vary across social contexts and content domains. In an artificial laboratory experiment, social pressure might be accountable by a simple bipolar variable, but in a working environment, more complex structures might be required. Hence, behaviour prediction research could involve two phases: the first to investigate the social pressure and cognitive submodels and the second to apply the whole causal model.

Up to this point we have been assuming a nomothetic standpoint. We have accepted that the same structures can be applied to different individuals (at least within the context of a given group). The idiographic alternative cannot be excluded from consideration, however. Especially in the cognitive domain, it might be that the mental structures of individuals differ to such a degree that no single model can be used to describe the nature and interrelationships amongst cognitions. Only research into cognitive structures will show whether it is permissable to adopt a nomothetic point of view. If the adoption of this approach is not viable, then the scientific study of behaviour prediction ceases to be possible. Science, as we normally understand the concept, assumes that phenomena can be accounted for nomothetically.

The nomothetic approach has been used successfully in the scientific study of physical events. Although this approach involves making assertions about regularities or invariances in the phenomena under investigation, sophisticated applications nevertheless may be highly dynamic and interactive: interrelated systems which change their states in complex ways may be modelled effectively. In the modelling of physical phenomena, however, one does not have to take account of modifications which might occur in the system through the actions of an independent agency within the system; the only active agent is the experimenter himself. Clouds do not think about their composition or will themselves to rain. Man, on the other hand, does appear to engage in these activities, activities which might be inherently unpredictable. The proportion of human mental and physical activities which are unpredictable (part of the "error term") will determine whether the regularities in human events are sufficiently predominant to make the modelling of these events viable.

The present models of human functioning are very primitive, as they do not even stretch the nomothetic approach to its limits. For a start, they are almost totally lacking in dynamic features. Recursive structural models (i.e., those which feed their "output" back into themselves) can be constructed, but there appears to be no way at present of modelling changes in the strengths of structural links over time, not to speak of changes in the structures themselves. Such modelling would require "meta-models", higher-level theories which would describe the changes over time in lower-level models. Human thought and behaviour is possibly of such complexity that meta-models will be necessary if there is to be any hope of accounting for these phenomena in a truly satisfactory way.

In the introduction it was said that the practice of performing controlled scientific research is salutary, whether or not proposed models are found to describe the data effectively. Whatever the outcome, new avenues of research are almost always suggested by the findings. Ultimately all models fail, but this need not be cause for lasting despair: the knowledge gained by examining the nature of the failure can help the scientist to generate new and better models. The present study constitutes a very small contribution in the challenge of modelling human thought and behaviour patterns. The lessons which were learned can be used to build better models in the future.

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APPENDIX I

Correlation Matrix: Priv Data

CORRELATION MATRIX - PRIV

	TE	TI	TR	TCE	TCI	TCR	SDE	SDI	SDR	LE
TE	1.0000									
TI	.7828	1.0000								
TR	.7751	.7716	1.0000							
TCE	.1279	.0731	.0605	1.0000						
TCI	.1183	.0539	.0357	.6807	1.0000					
TCR	.0841	.0044	-.0027	.7113	.7466	1.0000				
SDE	.7022	.7503	.7130	.0694	.0721	-.0280	1.0000			
SDI	.6475	.7747	.7397	.0823	.1004	.0647	.7980	1.0000		
SDR	.7135	.7328	.8192	.1241	.0843	.0279	.8547	.8116	1.0000	
LE	.7207	.6270	.6719	.1718	.1030	.0885	.6173	.5724	.6416	1.0000
LI	.7480	.8528	.7400	.1089	.0897	.0448	.7558	.7869	.7303	.6518
LR	.7546	.7448	.8313	.0912	.0291	.0144	.6935	.7112	.7979	.7245
WCC	-.1778	-.0988	-.1278	-.0907	-.1152	-.1128	.0100	-.0354	-.0065	-.1263
WCM	.0313	.0714	.1156	-.0567	-.0253	-.0056	.1596	.1091	.1281	.0172
PCE	.5311	.5211	.5241	.0307	-.0136	-.0130	.5286	.4980	.5490	.5248
PCI	.5653	.6505	.5521	.0768	.0878	.0457	.5739	.6398	.5441	.4797
PCR	.4169	.4525	.4746	.0886	-.0162	.0042	.4326	.4645	.5123	.4508
PME	.4608	.4799	.4190	.1183	.1061	.0941	.4264	.3538	.4020	.4808
PMI	.5494	.6049	.5352	.2217	.1567	.1416	.5842	.5344	.5293	.5267
PMR	.3895	.3744	.4055	.1825	.2298	.2219	.3480	.2948	.3895	.4144
CE	.6185	.5739	.6118	.0285	-.0155	-.0211	.5769	.5596	.6259	.5097
CI	.5930	.6870	.6364	.0662	.0765	.0333	.6857	.7423	.6922	.4690
CR	.7056	.6885	.7356	.0424	.0038	.0146	.6261	.6552	.7219	.5803
BIE	.6772	.6834	.7101	.1532	.0842	.0330	.6843	.6267	.7475	.6353
BII	.6409	.7457	.6712	.1471	.0834	.0429	.7161	.7517	.7407	.5359
BIR	.7077	.6999	.8061	.0954	.0748	.0497	.7100	.7122	.8020	.6102
BE	.6081	.6136	.6160	.1878	.1615	.1535	.5980	.5505	.6225	.5634
BI	.6065	.6634	.6399	.1968	.1878	.1753	.5786	.6172	.6253	.5455
BR	.5823	.5727	.6772	.1787	.1319	.1484	.5111	.5795	.6305	.5659

APPENDIX I

	LI	LR	WCC	WCM	PCE	PCI	PCR	PME	PMI	PMR
LI	1.0000									
LR	.7642	1.0000								
WCC	-.1425	-.1381	1.0000							
WCM	.0030	.0722	.4580	1.0000						
PCE	.5024	.5625	.0082	.1298	1.0000					
PCI	.6515	.5554	-.0265	.0825	.6348	1.0000				
PCR	.4935	.5507	-.0527	.0997	.5990	.6144	1.0000			
PME	.4441	.4883	-.1683	.0358	.5740	.3287	.2960	1.0000		
PMI	.6017	.5800	-.1837	.0784	.5311	.5562	.4046	.7067	1.0000	
PMR	.3521	.4942	-.1997	.0587	.3768	.2931	.3345	.6534	.6755	1.0000
CE	.5496	.6372	-.1127	.0784	.5312	.4701	.4412	.4631	.4881	.4037
CI	.7018	.6386	-.0139	.0817	.5195	.6109	.4447	.3330	.4689	.3011
CR	.6765	.7168	-.0528	.0646	.4991	.5118	.4762	.4240	.5049	.3703
BIE	.6361	.6730	-.0145	.0761	.6288	.5211	.4566	.5231	.5223	.3911
BII	.7476	.6673	-.0783	.0496	.5205	.6628	.5102	.4067	.5574	.3425
BIR	.7071	.7660	-.1269	.0555	.5152	.5504	.4897	.5167	.5784	.5162
BE	.5735	.5979	-.0464	.0758	.5059	.5192	.3711	.4315	.5503	.4214
BI	.6440	.5984	-.0571	.0468	.4854	.5845	.4187	.4167	.5529	.3928
BR	.5647	.6067	-.0891	.0718	.5303	.4895	.4228	.4508	.5271	.4667

	CE	CI	CR	BIE	BII	BIR	BE	BI	BR
CE	1.0000								
CI	.5173	1.0000							
CR	.6951	.6963	1.0000						
BIE	.5754	.5951	.6227	1.0000					
BII	.5348	.6999	.6422	.7496	1.0000				
BIR	.6264	.6649	.7537	.7890	.7899	1.0000			
BE	.4524	.5890	.5693	.6606	.6231	.6795	1.0000		
BI	.4357	.6129	.5986	.6519	.7014	.7044	.9006	1.0000	
BR	.4889	.5141	.5703	.6000	.6046	.7250	.7716	.7574	1.0000

APPENDIX I

APPENDIX II

Correlation Matrix: Pub Data

CORRELATION MATRIX - PUB

	TE	TI	TR	TCE	TCI	TCR	SDE	SDI	SDR	LE
TE	1.0000									
TI	.6599	1.0000								
TR	.7138	.7022	1.0000							
TCE	.1751	.1175	.1170	1.0000						
TCI	.1725	.0838	.0084	.5318	1.0000					
TCR	.0571	.1046	-.0962	.6165	.5831	1.0000				
SDE	.7229	.6297	.6705	.0599	.0346	-.0289	1.0000			
SDI	.6722	.7074	.6847	.1762	.0275	-.0198	.7225	1.0000		
SDR	.6733	.6731	.8141	.1367	.0552	-.0192	.7284	.7680	1.0000	
LE	.7609	.5880	.6405	.1607	.1025	.0117	.6292	.6442	.6163	1.0000
LI	.6828	.7505	.7337	.0770	-.0011	-.0395	.6950	.7699	.7286	.6748
LR	.6948	.6801	.7995	.1547	.0436	-.0150	.5854	.6845	.7710	.6700
WCC	-.0238	.0353	.0293	-.0489	-.1130	-.1533	.0522	.0236	.0131	-.0097
WCM	.0628	.0510	.1638	.0871	-.0109	-.0659	.0877	.0852	.0901	.1060
PCE	.5434	.4710	.5422	.0139	.0609	-.0600	.4956	.4843	.5015	.5373
PCI	.4122	.4913	.4948	.0153	-.0436	-.1337	.4591	.6027	.4862	.4271
PCR	.4916	.3547	.6401	.1248	-.0142	-.0648	.4141	.4544	.5623	.4985
PME	.5000	.3314	.3877	.0729	.1587	.0042	.4193	.4822	.3889	.4535
PMI	.4143	.4025	.3679	.1157	.0955	-.0154	.3696	.5014	.3822	.4090
PMR	.3686	.1947	.4171	.1051	.1409	.0148	.3030	.3224	.3824	.3824
CE	.5717	.4876	.5652	.0634	-.0098	-.0690	.4654	.4888	.4942	.5359
CI	.6417	.6488	.6259	.1142	.0712	-.0147	.6153	.6959	.6349	.5666
CR	.6059	.5723	.6656	.0855	-.0469	-.1006	.5455	.5940	.6835	.5679
BIE	.7595	.6141	.6945	.0923	.0650	-.0091	.6828	.6498	.6949	.7107
BII	.6210	.7085	.6575	.1346	.0527	.0154	.5789	.7007	.6465	.5766
BIR	.7347	.6774	.7988	.1475	.0356	-.0095	.6553	.6970	.8097	.6378
BE	.6138	.4951	.5854	.2290	.0843	.1039	.5900	.5795	.5981	.6094
BI	.5521	.5513	.5616	.1869	.0962	.0762	.5791	.6267	.5629	.5194
BR	.5050	.4354	.5710	.2477	.1244	.0695	.3905	.5067	.5368	.4905

APPENDIX II

	LI	LR	WCC	WCM	PCE	PCI	PCR	PME	PMI	PMR
LI	1.0000									
LR	.7920	1.0000								
WCC	.0072	.0120	1.0000							
WCM	.1053	.1041	.6714	1.0000						
PCE	.5155	.4751	.0956	.1187	1.0000					
PCI	.6572	.4426	.0564	.0493	.4868	1.0000				
PCR	.5426	.5508	.0208	.1319	.4984	.5575	1.0000			
PME	.4013	.3748	-.0254	-.0389	.5337	.2648	.2831	1.0000		
PMI	.4815	.3614	.0425	.0033	.3015	.5553	.3440	.4764	1.0000	
PMR	.2619	.3564	-.0140	-.0617	.3277	.2497	.4227	.5123	.4523	1.0000
CE	.5233	.5437	-.0279	-.0009	.4836	.3822	.3837	.4612	.3651	.3645
CI	.7672	.6540	.0980	.1513	.5562	.6461	.5104	.4439	.5228	.3088
CR	.6520	.7142	.1011	.1093	.4220	.4854	.5168	.2682	.3456	.2506
BIE	.6895	.6457	.0702	.1161	.6423	.4734	.5074	.5489	.4497	.4208
BII	.7107	.6791	.0164	.0804	.4530	.5298	.4300	.3379	.4303	.1828
BIR	.7331	.7527	.0314	.1125	.4917	.4913	.5863	.3932	.4149	.3455
BE	.5239	.5626	.0294	.1512	.3985	.2967	.3388	.3609	.2644	.2925
BI	.5839	.5785	.0081	.1015	.3096	.4068	.3064	.3184	.3961	.2099
BR	.4401	.5506	-.1369	.0467	.2727	.3150	.4037	.2226	.2011	.3509

	CE	CI	CR	BIE	BII	BIR	BE	BI	BR
CE	1.0000								
CI	.5190	1.0000							
CR	.5860	.5351	1.0000						
BIE	.6144	.6554	.5433	1.0000					
BII	.4790	.6048	.5980	.6820	1.0000				
BIR	.5360	.6457	.6397	.7834	.7494	1.0000			
BE	.3945	.4777	.4362	.6479	.5127	.5895	1.0000		
BI	.3852	.5484	.4305	.5101	.6242	.5247	.7509	1.0000	
BR	.4402	.4243	.4097	.4531	.4979	.5269	.6308	.6089	1.0000

APPENDIX II

APPENDIX III

Covariance Matrix: Priv Data

Variables used in confirmatory analyses

COVARIANCE MATRIX - PRIV

	TE	TI	TR	SDE	SDI	SDR	LE	LI	LR	PCE1
TE	15.555									
TI	11.551	14.933								
TR	12.496	12.117	17.118							
SDE	18.339	18.792	19.205	42.318						
SDI	19.040	21.568	22.007	37.578	51.196					
SDR	20.370	20.052	23.953	39.470	41.082	49.941				
LE	9.709	8.165	9.488	13.268	13.972	15.236	11.300			
LI	10.745	12.011	11.065	17.702	20.710	18.899	8.039	13.255		
LR	11.100	10.684	12.862	16.919	19.743	21.295	9.045	10.274	14.267	
PCE1	1.439	0.956	1.262	1.811	2.113	2.348	1.202	1.071	1.311	0.850
PCE2	1.785	1.847	2.106	3.221	3.520	3.666	1.663	1.636	2.034	0.452
PCE3	1.912	1.701	1.840	3.208	3.187	3.454	1.422	1.601	1.768	0.492
PCI1	1.990	2.254	2.019	3.465	3.855	3.611	1.397	2.229	1.887	0.218
PCI2	1.601	1.832	1.759	2.706	3.672	2.717	1.255	1.755	1.478	0.390
PCI3	1.768	2.029	1.956	2.793	3.712	3.116	1.331	1.829	1.838	0.364
PCR1	0.622	0.712	0.625	1.110	1.669	1.185	0.417	0.836	0.715	0.110
PCR2	1.461	1.347	1.913	2.494	2.836	3.379	1.138	1.170	1.838	0.344
PCR3	1.140	1.189	1.373	1.751	1.888	2.221	1.198	1.080	1.363	0.275
PME1	1.446	1.259	1.193	2.050	2.053	2.136	1.185	1.160	1.207	0.425
PME2	1.813	1.916	1.760	2.769	2.692	2.805	1.608	1.581	1.964	0.271
PME3	1.303	1.297	1.173	2.255	1.764	2.326	1.126	1.059	1.317	0.347
PMI1	2.026	2.223	1.960	3.586	3.220	3.713	1.740	2.058	2.002	0.296
PMI2	1.169	1.275	1.207	1.948	2.156	2.076	0.928	1.194	1.193	0.187
PMI3	1.652	1.766	1.633	2.528	2.904	2.454	1.362	1.556	1.590	0.216
PMR1	0.984	0.886	1.194	1.304	1.202	1.803	1.120	0.782	1.423	0.087
PMR2	1.213	1.031	1.357	1.974	1.933	2.309	0.840	0.907	1.362	0.255
PMR3	1.285	1.094	1.216	1.868	1.648	2.200	1.130	0.941	1.367	0.204
CE1	2.056	1.753	1.658	2.763	2.260	2.585	1.880	1.708	2.278	0.060
CE2	3.531	2.993	2.794	5.696	6.505	6.611	2.500	2.743	2.593	0.546
CE3	4.977	4.450	5.604	8.197	8.272	10.176	3.743	3.987	5.366	0.788
CE4	1.203	0.866	1.254	2.189	2.675	2.976	1.017	0.799	1.333	0.500
CI1	0.771	1.690	1.361	2.613	4.416	2.422	0.132	1.645	0.942	0.094
CI2	5.206	4.946	5.113	8.881	9.510	9.830	3.429	4.801	5.013	0.576
CI3	3.710	4.329	4.120	7.033	8.697	7.244	2.594	3.788	3.680	0.423
CI4	2.757	2.778	2.953	5.435	6.113	6.754	2.215	2.858	2.766	0.396
CR1	2.047	2.264	2.210	3.717	4.352	4.191	1.162	1.742	1.848	0.035
CR2	5.286	4.993	5.501	6.307	7.132	8.374	4.387	4.471	5.493	0.685
CR3	1.789	1.689	2.232	3.376	4.406	4.464	1.038	1.635	1.876	0.351
CR4	5.088	4.499	4.799	7.556	8.074	9.092	3.601	4.472	4.701	0.449
BIE1	1.972	1.936	2.102	3.111	3.324	3.739	1.727	1.715	1.940	0.289
BIE2	3.130	2.851	3.210	4.970	4.997	5.815	2.410	2.622	2.654	0.533
BIE3	1.942	1.973	2.260	3.773	3.634	4.447	1.644	1.899	1.812	0.294
BII1	3.025	3.448	3.162	5.171	6.077	5.925	2.045	3.300	2.993	0.299
BII2	2.093	2.660	2.256	4.333	5.187	5.096	1.690	2.510	2.227	0.260
BII3	2.270	2.585	2.846	4.349	4.846	4.754	1.700	2.373	2.231	0.283
BIR1	2.767	2.576	3.249	4.869	5.222	5.959	2.047	2.405	2.778	0.281
BIR2	2.129	1.908	2.365	3.618	3.709	4.213	1.558	1.919	2.128	0.202
BIR3	3.556	3.553	4.379	5.760	6.766	7.356	2.772	3.330	3.802	0.406
BE1	1.398	1.387	1.527	2.300	2.260	2.554	1.242	1.236	1.275	0.196
BE2	1.257	1.249	1.339	1.973	2.205	2.375	0.954	1.106	1.141	0.199
BI1	1.374	1.483	1.483	2.064	2.501	2.435	1.063	1.356	1.233	0.171
BI2	1.272	1.393	1.457	2.087	2.530	2.539	1.035	1.339	1.253	0.183
BR1	1.409	1.345	1.828	2.050	2.687	2.929	1.273	1.331	1.504	0.224
BR2	1.273	1.222	1.489	1.719	2.185	2.280	1.080	1.126	1.254	0.214

APPENDIX III

	PCE2	PCE3	PCI1	PCI2	PCI3	PCR1	PCR2	PCR3	PME1	PME2
PCE2	1.038									
PCE3	0.581	0.800								
PCI1	0.346	0.333	1.145							
PCI2	0.427	0.482	0.373	0.834						
PCI3	0.618	0.477	0.514	0.553	1.012					
PCR1	0.181	0.132	0.272	0.106	0.214	0.754				
PCR2	0.503	0.468	0.298	0.388	0.455	0.124	0.713			
PCR3	0.399	0.294	0.283	0.256	0.413	0.124	0.324	0.805		
PME1	0.323	0.405	0.164	0.269	0.245	0.077	0.250	0.166	0.745	
PME2	0.606	0.420	0.206	0.212	0.326	0.144	0.297	0.259	0.432	1.320
PME3	0.312	0.463	0.142	0.283	0.204	-0.045	0.261	0.192	0.505	0.674
PMI1	0.475	0.453	0.511	0.356	0.412	-0.001	0.288	0.270	0.340	0.666
PMI2	0.229	0.266	0.153	0.253	0.172	0.045	0.136	0.141	0.295	0.397
PMI3	0.391	0.360	0.328	0.342	0.427	0.248	0.291	0.266	0.250	0.618
PMR1	0.209	0.165	0.232	0.039	0.209	0.086	0.221	0.171	0.193	0.450
PMR2	0.309	0.318	0.097	0.167	0.212	0.142	0.311	0.124	0.364	0.730
PMR3	0.332	0.291	0.123	0.207	0.193	0.089	0.278	0.268	0.288	0.530
CE1	0.167	0.177	0.440	0.076	0.175	0.194	0.044	0.177	0.073	0.561
CE2	0.470	0.631	0.510	0.485	0.643	0.201	0.401	0.580	0.656	0.670
CE3	1.219	0.965	0.704	0.674	0.679	0.246	0.750	0.642	0.706	0.908
CE4	0.463	0.514	0.343	0.381	0.366	0.168	0.479	0.273	0.194	0.129
CI1	0.601	0.391	0.217	0.618	0.526	0.102	0.212	0.120	0.064	0.231
CI2	0.731	0.733	0.949	0.763	0.955	0.433	0.746	0.510	0.551	0.563
CI3	0.809	0.610	0.875	0.691	0.902	0.226	0.661	0.405	0.426	0.656
CI4	0.588	0.459	0.595	0.470	0.520	0.143	0.454	0.225	0.209	0.304
CR1	0.323	0.207	0.343	0.289	0.337	0.157	0.117	0.195	0.032	0.146
CR2	0.956	0.778	0.714	0.602	0.644	0.143	0.558	0.639	0.710	1.029
CR3	0.624	0.436	0.329	0.387	0.587	0.159	0.570	0.340	0.244	0.376
CR4	0.567	0.637	0.846	0.604	0.598	0.582	0.538	0.563	0.524	0.828
BIE1	0.439	0.356	0.293	0.300	0.343	0.050	0.318	0.314	0.292	0.386
BIE2	0.545	0.583	0.414	0.430	0.470	0.096	0.432	0.410	0.535	0.434
BIE3	0.404	0.417	0.402	0.371	0.381	0.065	0.313	0.211	0.313	0.335
BII1	0.528	0.444	0.725	0.540	0.599	0.200	0.366	0.390	0.258	0.404
BII2	0.579	0.413	0.740	0.421	0.599	0.219	0.366	0.352	0.204	0.409
BII3	0.441	0.376	0.422	0.410	0.507	0.134	0.392	0.347	0.292	0.328
BIR1	0.511	0.444	0.481	0.412	0.460	0.235	0.453	0.279	0.322	0.404
BIR2	0.382	0.306	0.375	0.263	0.374	0.076	0.365	0.338	0.270	0.396
BIR3	0.674	0.577	0.620	0.510	0.653	0.077	0.612	0.420	0.419	0.657
BE1	0.285	0.232	0.287	0.209	0.251	0.005	0.190	0.184	0.200	0.220
BE2	0.253	0.224	0.252	0.199	0.259	0.039	0.190	0.167	0.172	0.205
BI1	0.262	0.214	0.283	0.258	0.285	0.038	0.200	0.186	0.181	0.200
BI2	0.285	0.205	0.307	0.245	0.310	0.074	0.210	0.213	0.179	0.248
BR1	0.356	0.250	0.250	0.235	0.282	0.041	0.263	0.223	0.176	0.237
BR2	0.308	0.217	0.213	0.213	0.252	0.053	0.199	0.176	0.181	0.273

APPENDIX III

	PME3	PMI1	PMI2	PMI3	PMR1	PMR2	PMR3	CE1	CE2	CE3
PME3	0.817									
PMI1	0.462	1.262								
PMI2	0.384	0.312	0.509							
PMI3	0.424	0.502	0.310	1.048						
PMR1	0.185	0.295	0.170	0.365	0.981					
PMR2	0.549	0.339	0.309	0.425	0.350	0.813				
PMR3	0.421	0.387	0.247	0.567	0.405	0.428	0.923			
CE1	0.297	0.456	0.228	0.551	0.311	0.315	0.350	3.410		
CE2	0.595	0.674	0.502	0.605	0.288	0.434	0.383	0.261	5.223	
CE3	0.779	1.016	0.638	0.559	0.429	0.721	0.705	0.857	0.942	4.730
CE4	0.167	0.386	0.096	0.242	0.314	0.169	0.325	-0.250	1.287	0.452
CI1	0.127	0.067	0.267	0.007	-0.134	0.229	-0.045	-0.391	0.110	0.614
CI2	0.548	0.914	0.435	0.601	0.355	0.561	0.430	0.922	1.515	2.158
CI3	0.424	0.712	0.458	0.688	0.507	0.427	0.305	0.038	2.147	1.469
CI4	0.348	0.648	0.293	0.333	0.231	0.268	0.270	0.260	0.814	1.617
CR1	0.073	0.221	0.176	0.200	0.120	0.117	0.080	-0.398	1.180	0.746
CR2	0.709	1.100	0.532	0.702	0.567	0.666	0.710	1.679	0.725	3.520
CR3	0.260	0.400	0.156	0.183	0.171	0.362	0.268	-0.468	1.158	1.240
CR4	0.625	0.864	0.648	0.582	0.473	0.684	0.397	1.005	1.597	2.044
BIE1	0.344	0.430	0.262	0.282	0.198	0.248	0.296	0.296	0.555	1.164
BIE2	0.519	0.502	0.382	0.346	0.213	0.371	0.318	0.235	1.016	1.461
BIE3	0.329	0.338	0.254	0.283	0.250	0.223	0.237	0.194	0.647	1.220
BII1	0.339	0.592	0.294	0.441	0.197	0.240	0.268	0.564	0.815	1.639
BII2	0.234	0.525	0.228	0.451	0.230	0.114	0.203	0.381	0.650	1.010
BII3	0.296	0.479	0.275	0.328	0.134	0.263	0.237	0.196	0.671	1.048
BIR1	0.321	0.429	0.241	0.378	0.325	0.315	0.274	0.227	0.757	1.337
BIR2	0.319	0.523	0.201	0.328	0.299	0.285	0.338	0.362	0.687	1.257
BIR3	0.478	0.719	0.349	0.551	0.456	0.500	0.484	0.373	1.098	1.787
BE1	0.203	0.346	0.179	0.223	0.170	0.165	0.189	0.224	0.217	0.690
BE2	0.199	0.308	0.150	0.218	0.155	0.146	0.178	0.150	0.278	0.600
BI1	0.183	0.316	0.163	0.217	0.162	0.135	0.164	0.204	0.237	0.605
BI2	0.185	0.306	0.176	0.248	0.169	0.138	0.192	0.202	0.304	0.615
BR1	0.176	0.305	0.169	0.229	0.175	0.194	0.225	0.211	0.294	0.765
BR2	0.175	0.306	0.146	0.219	0.183	0.169	0.210	0.152	0.255	0.642

APPENDIX III

	CE4	CI1	CI2	CI3	CI4	CR1	CR2	CR3	CR4	BIE1
CE4	3.258									
CI1	0.625	3.993								
CI2	0.704	0.755	3.629							
CI3	0.879	1.070	2.009	4.181						
CI4	0.265	0.425	1.566	1.433	3.129					
CR1	0.700	1.051	1.173	1.493	0.793	2.661				
CR2	0.027	0.325	1.920	1.000	1.301	0.390	5.025			
CR3	1.705	1.129	1.261	1.528	0.566	1.075	0.521	2.726		
CR4	0.548	0.522	2.356	1.556	1.093	0.988	1.797	0.844	3.588	
BIE1	0.174	0.082	0.877	0.656	0.648	0.281	0.929	0.464	0.834	0.852
BIE2	0.283	0.281	1.271	1.046	0.933	0.439	1.375	0.640	1.259	0.679
BIE3	0.395	0.062	0.772	0.631	0.748	0.547	0.850	0.496	0.759	0.452
BII1	0.255	0.532	1.564	1.198	0.988	0.839	1.398	0.720	1.403	0.672
BII2	0.469	0.429	1.129	1.054	1.108	0.739	0.706	0.577	0.929	0.588
BII3	0.316	0.380	1.204	0.985	0.793	0.538	0.819	0.639	0.895	0.623
BIR1	0.359	0.305	1.326	1.081	1.110	0.775	1.102	0.546	1.217	0.620
BIR2	0.294	0.076	1.042	0.770	0.682	0.415	0.878	0.766	1.063	0.634
BIR3	0.722	0.561	1.686	1.374	1.039	0.837	1.758	1.067	1.440	0.710
BE1	0.112	0.204	0.596	0.541	0.467	0.237	0.720	0.278	0.463	0.272
BE2	0.112	0.184	0.560	0.519	0.480	0.233	0.599	0.286	0.464	0.277
BI1	0.073	0.255	0.628	0.563	0.507	0.260	0.656	0.253	0.500	0.283
BI2	0.166	0.252	0.619	0.534	0.422	0.255	0.559	0.373	0.581	0.303
BR1	0.240	0.205	0.610	0.499	0.519	0.224	0.779	0.370	0.533	0.294
BR2	0.153	0.201	0.512	0.437	0.400	0.191	0.682	0.253	0.504	0.245

	BIE2	BIE3	BII1	BII2	BII3	BIR1	BIR2	BIR3	BE1	BE2
BIE2	1.359									
BIE3	0.655	1.412								
BII1	0.841	0.624	1.841							
BII2	0.569	0.783	0.966	1.656						
BII3	0.756	0.578	0.759	0.651	0.980					
BIR1	0.829	0.880	0.858	0.925	0.764	1.376				
BIR2	0.651	0.497	0.723	0.595	0.644	0.688	0.999			
BIR3	1.019	0.816	1.073	0.869	0.933	1.091	0.915	1.762		
BE1	0.412	0.329	0.360	0.344	0.340	0.384	0.299	0.501	0.390	
BE2	0.377	0.283	0.361	0.331	0.321	0.361	0.290	0.474	0.292	0.309
BI1	0.390	0.269	0.423	0.375	0.350	0.382	0.307	0.490	0.313	0.278
BI2	0.358	0.286	0.456	0.423	0.338	0.351	0.330	0.512	0.261	0.273
BR1	0.421	0.325	0.396	0.392	0.394	0.437	0.366	0.626	0.295	0.250
BR2	0.362	0.258	0.364	0.335	0.305	0.364	0.298	0.535	0.257	0.247

	BI1	BI2	BR1	BR2
BI1	0.344			
BI2	0.272	0.337		
BR1	0.266	0.254	0.438	
BR2	0.240	0.256	0.312	0.332

APPENDIX III

APPENDIX IV

Covariance Matrix: Pub Data

Variables used in confirmatory analyses

COVARIANCE MATRIX - PUB

	TE	TI	TR	SDE	SDI	SDR	LE	LI	LR	PCE1
TE	14.087									
TI	8.418	11.268								
TR	10.556	9.046	15.036							
SDE	18.320	14.922	18.311	46.635						
SDI	19.687	18.148	19.714	38.886	59.122					
SDR	18.588	16.318	22.503	37.201	42.907	52.980				
LE	9.688	6.782	8.581	14.524	16.637	15.103	11.322			
LI	9.887	9.586	11.119	18.591	22.428	20.093	8.779	14.489		
LR	10.886	9.299	12.766	16 924	21.411	22.863	9.280	12.512	16.866	
PCE1	1.482	1.072	1.376	2.542	2.590	2.591	1.348	1.199	1.179	1.102
PCE2	1.227	1.134	1.558	2.100	2.838	2.704	1.081	1.390	1.371	0.284
PCE3	1.776	1.281	1.787	3.228	3.078	3.056	1.575	1.816	1.639	0.573
PCI1	0.732	1.033	1.034	1.186	2.337	2.030	0.829	1.556	1.198	0.085
PCI2	1.828	1.747	2.055	3.724	4.677	3.534	1.675	2.680	1.986	0.398
PCI3	1.104	0.862	1.222	1.796	2.790	1.888	0.917	1.409	0.890	0.209
PCR1	1.289	0.605	1.481	1.743	1.904	2.035	1.162	1.293	1.295	-0.006
PCR2	1.420	0.937	1.991	2.425	2.788	3.376	1.343	1.650	1.837	0.408
PCR3	1.395	0.935	1.673	2.009	2.560	3.121	1.246	1.503	1.692	0.337
PME1	1.461	0.817	0.997	2.420	2.767	2.045	1.125	1.077	1.093	0.345
PME2	0.888	0.851	1.097	1.640	2.645	2.211	0.969	1.218	1.123	0.203
PME3	1.311	0.484	0.828	2.169	2.434	1.806	1.021	0.855	0.853	0.329
PMI1	0.760	0.806	0.883	0.981	2.076	1.796	0.853	1.109	0.935	0.052
PMI2	1.209	0.758	0.909	1.978	2.341	1.732	0.812	1.244	0.964	0.155
PMI3	1.340	1.120	1.061	1.983	3.055	1.860	1.231	1.398	1.063	0.117
PMR1	0.795	0.358	0.834	1.218	1.350	1.537	0.910	0.611	0.716	0.065
PMR2	0.967	0.570	1.174	1.343	2.042	2.159	0.796	0.820	1.260	0.224
PMR3	1.265	0.571	1.355	1.853	1.961	2.341	1.085	0.908	1.272	0.228
CE1	1.752	1.161	1.749	2.440	1.285	2.360	1.557	1.189	1.694	0.268
CE2	3.661	2.584	3.306	4.669	6.554	5.751	3.197	3.732	3.541	0.449
CE3	3.750	2.812	3.940	6.761	6.628	6.282	3.051	3.577	3.923	0.724
CE4	1.136	1.393	1.132	1.831	3.651	2.967	1.028	1.663	1.622	0.413
CI1	2.185	1.975	2.190	4.498	6.130	4.728	1.860	3.047	2.521	0.481
CI2	4.645	4.079	4.456	7.102	9.341	8.322	3.972	5.430	5.195	0.655
CI3	2.935	2.974	3.036	5.930	6.557	6.007	2.140	3.837	3.571	0.450
CI4	4.932	3.513	4.463	8.343	9.376	8.011	3.895	4.986	4.846	0.572
CR1	1.638	1.428	2.037	2.714	3.858	4.373	1.321	2.135	2.358	0.122
CR2	2.880	2.546	3.322	4.578	5.493	6.241	2.499	3.018	3.650	0.291
CR3	1.474	1.264	1.850	2.855	3.455	3.856	1.613	1.861	1.916	0.378
CR4	4.328	3.255	4.486	6.416	7.140	7.350	3.206	4.351	5.075	0.326
BIE1	2.617	2.001	2.606	4.524	4.744	4.938	2.112	2.540	2.487	0.461
BIE2	3.522	2.644	3.241	5.629	6.352	6.124	3.126	3.344	3.306	0.621
BIE3	3.158	2.239	2.932	5.328	5.284	5.516	2.631	2.858	2.892	0.538
BII1	2.734	3.015	3.360	4.467	6.188	5.669	2.416	3.357	3.493	0.254
BII2	2.030	2.009	1.946	3.315	4.430	3.606	1.934	2.383	2.586	0.195
BII3	2.203	2.175	2.370	4.337	5.281	4.640	1.564	2.560	2.300	0.378
BIR1	3.507	3.086	3.724	5.643	6.873	7.359	2.921	3.615	3.928	0.420
BIR2	2.499	1.877	2.912	4.214	4.461	5.127	1.896	2.519	2.821	0.308
BIR3	3.168	2.800	3.842	5.244	6.655	7.319	2.541	3.448	3.800	0.363
BE1	1.475	1.114	1.449	2.441	2.831	2.736	1.301	1.336	1.479	0.174
BE2	1.170	0.875	1.173	2.023	2.117	2.103	1.046	0.987	1.206	0.134
BI1	1.336	1.155	1.343	2.608	2.978	2.532	1.084	1.442	1.489	0.106
BI2	1.032	1.004	1.193	1.767	2.386	2.030	0.876	1.111	1.235	0.060
BR1	1.294	0.934	1.497	1.623	2.451	2.410	1.064	1.134	1.488	0.063
BR2	0.936	0.845	1.120	1.396	1.978	2.036	0.838	0.867	1.172	0.065

	PCE2	PCE3	PCI1	PCI2	PCI3	PCR1	PCR2	PCR3	PME1	PME2
PCE2	0.630									
PCE3	0.289	1.044								
PCI1	0.225	0.094	1.037							
PCI2	0.370	0.641	0.208	1.333						
PCI3	0.278	0.313	0.139	0.450	0.811					
PCR1	0.203	0.053	0.267	0.286	0.277	1.045				
PCR2	0.261	0.406	0.123	0.473	0.191	0.205	0.902			
PCR3	0.315	0.385	0.183	0.428	0.328	0.252	0.352	0.936		
PME1	0.101	0.319	-0.013	0.212	0.027	-0.060	0.233	0.035	0.929	
PME2	0.404	0.192	0.163	0.342	0.209	0.151	0.170	0.282	0.193	0.857
PME3	0.120	0.382	0.009	0.269	0.120	0.075	0.209	0.134	0.508	0.149
PMI1	0.262	0.096	0.441	0.269	0.145	0.294	0.063	0.182	0.036	0.360
PMI2	0.116	0.258	0.037	0.583	0.130	0.136	0.183	0.148	0.363	0.244
PMI3	0.208	0.234	-0.005	0.339	0.401	0.164	0.161	0.162	0.296	0.274
PMR1	0.134	0.159	0.172	0.265	0.192	0.184	0.140	0.259	0.118	0.165
PMR2	0.138	0.271	0.055	0.250	0.087	0.158	0.384	0.249	0.391	0.170
PMR3	0.205	0.226	0.048	0.218	0.094	0.192	0.216	0.260	0.325	0.307
CE1	0.174	-0.011	0.220	0.158	-0.067	0.119	0.316	0.212	0.096	0.238
CE2	0.458	0.665	0.400	0.795	0.458	0.252	0.552	0.514	0.756	0.618
CE3	0.660	0.718	0.244	0.859	0.410	0.353	0.712	0.487	0.494	0.609
CE4	0.420	0.273	0.488	0.321	0.219	0.177	0.183	0.188	0.165	0.419
CI1	0.535	0.718	0.317	0.995	0.523	0.419	0.267	0.367	0.278	0.438
CI2	0.686	0.925	0.557	1.269	0.662	0.430	0.830	0.795	0.485	0.603
CI3	0.457	0.579	0.462	0.880	0.365	0.397	0.377	0.289	0.320	0.419
CI4	0.554	0.841	0.462	1.286	0.624	0.530	0.652	0.713	0.460	0.635
CR1	0.313	0.199	0.447	0.340	0.177	0.217	0.268	0.246	0.138	0.360
CR2	0.470	0.397	0.339	0.349	0.445	0.609	0.357	0.354	0.167	0.168
CR3	0.483	0.338	0.316	0.502	0.358	0.276	0.410	0.376	0.130	0.368
CR4	0.543	0.630	0.396	0.788	0.379	0.479	0.750	0.650	0.394	0.387
BIE1	0.336	0.595	0.119	0.701	0.303	0.302	0.495	0.399	0.402	0.258
BIE2	0.466	0.724	0.313	0.710	0.364	0.230	0.535	0.464	0.596	0.427
BIE3	0.379	0.587	0.129	0.614	0.271	0.232	0.472	0.382	0.468	0.308
BII1	0.413	0.365	0.391	0.629	0.365	0.400	0.461	0.377	0.287	0.297
BII2	0.272	0.359	0.264	0.496	0.140	0.206	0.262	0.280	0.106	0.263
BII3	0.310	0.565	0.131	0.766	0.340	0.160	0.349	0.286	0.300	0.277
BIR1	0.453	0.421	0.353	0.580	0.265	0.405	0.479	0.467	0.407	0.365
BIR2	0.306	0.510	0.165	0.557	0.368	0.346	0.464	0.445	0.270	0.188
BIR3	0.382	0.514	0.340	0.585	0.386	0.386	0.566	0.531	0.276	0.296
BE1	0.160	0.248	0.102	0.245	0.141	0.145	0.152	0.144	0.195	0.152
BE2	0.105	0.195	0.081	0.161	0.097	0.136	0.120	0.142	0.111	0.060
BI1	0.135	0.205	0.111	0.291	0.170	0.126	0.125	0.147	0.116	0.177
BI2	0.142	0.140	0.165	0.218	0.121	0.162	0.079	0.129	0.094	0.173
BR1	0.145	0.170	0.146	0.232	0.163	0.227	0.210	0.242	0.018	0.130
BR2	0.107	0.143	0.112	0.135	0.098	0.132	0.085	0.153	0.087	0.110

APPENDIX IV

	PME3	PMI1	PMI2	PMI3	PMR1	PMR2	PMR3	CE1	CE2	CE3
PME3	0.931									
PMI1	0.087	0.776								
PMI2	0.400	0.170	0.941							
PMI3	0.196	0.128	0.286	0.920						
PMR1	0.213	0.219	0.223	0.245	0.946					
PMR2	0.403	0.125	0.375	0.192	0.201	0.814				
PMR3	0.391	0.116	0.291	0.273	0.379	0.405	1.063			
CE1	0.027	0.236	-0.104	0.237	-0.011	0.117	0.198	3.673		
CE2	0.578	0.132	0.484	0.519	0.287	0.698	0.736	0.492	5.135	
CE3	0.474	0.494	0.442	0.359	0.147	0.590	0.397	1.385	1.321	3.872
CE4	0.152	0.369	0.184	0.369	0.080	0.239	0.141	-0.089	0.268	0.538
CI1	0.449	0.523	0.501	0.399	0.185	0.368	0.444	-0.478	0.767	0.750
CI2	0.509	0.541	0.685	0.658	0.191	0.529	0.400	1.108	1.946	2.122
CI3	0.352	0.389	0.492	0.264	0.061	0.165	0.243	0.102	0.899	1.321
CI4	0.498	0.358	0.744	0.592	0.397	0.516	0.616	0.617	1.522	1.904
CR1	0.074	0.282	0.125	0.211	0.104	0.170	0.154	0.127	0.894	0.724
CR2	-0.005	0.335	0.014	0.211	0.003	0.254	0.191	1.015	0.586	1.840
CR3	0.117	0.309	0.153	0.227	0.162	0.208	0.237	0.074	0.658	0.795
CR4	0.245	0.336	0.378	0.398	0.193	0.491	0.309	1.022	1.432	1.795
BIE1	0.377	0.181	0.394	0.368	0.187	0.320	0.282	0.325	1.103	0.942
BIE2	0.586	0.259	0.432	0.403	0.301	0.399	0.555	0.524	1.557	1.397
BIE3	0.376	0.243	0.307	0.500	0.196	0.347	0.368	0.420	1.288	1.308
BII1	0.136	0.299	0.230	0.440	0.140	0.245	0.164	0.453	0.896	1.032
BII2	0.126	0.264	0.191	0.238	0.053	0.142	0.063	0.311	0.685	0.756
BII3	0.270	0.175	0.356	0.375	0.023	0.153	0.235	0.206	0.649	0.910
BIR1	0.320	0.357	0.322	0.416	0.175	0.327	0.376	0.513	1.051	1.167
BIR2	0.299	0.217	0.281	0.377	0.205	0.289	0.266	0.193	0.801	0.853
BIR3	0.250	0.280	0.273	0.402	0.193	0.420	0.270	0.451	1.137	1.231
BE1	0.194	0.129	0.139	0.206	0.113	0.105	0.148	0.136	0.504	0.462
BE2	0.140	0.110	0.056	0.085	0.154	0.080	0.131	0.141	0.324	0.378
BI1	0.110	0.155	0.193	0.216	0.082	0.087	0.095	0.116	0.407	0.410
BI2	0.074	0.128	0.142	0.132	0.075	0.098	0.091	0.060	0.376	0.385
BR1	0.060	0.097	0.060	0.144	0.140	0.160	0.144	0.308	0.538	0.353
BR2	0.121	0.065	0.080	0.102	0.144	0.143	0.164	0.105	0.485	0.295

APPENDIX IV

	CE4	CI1	CI2	CI3	CI4	CR1	CR2	CR3	CR4	BIE1
CE4	2.700									
CI1	0.972	3.316								
CI2	0.306	1.405	4.313							
CI3	0.966	1.745	1.703	3.362						
CI4	0.472	1.215	2.519	1.284	4.041					
CR1	0.497	0.754	0.843	0.908	0.691	2.147				
CR2	0.285	0.423	1.418	0.539	0.893	0.738	4.185			
CR3	0.939	0.896	0.762	0.994	0.643	0.572	0.475	1.955		
CR4	0.075	0.319	2.128	0.827	1.806	0.618	1.144	0.476	3.469	
BIE1	0.198	0.571	1.195	0.689	1.118	0.315	0.557	0.467	0.960	1.165
BIE2	0.364	0.802	1.592	0.892	1.479	0.599	0.825	0.539	1.172	0.934
BIE3	0.420	0.767	1.538	0.881	1.417	0.461	0.879	0.518	1.027	0.883
BII1	0.460	0.692	1.243	0.848	1.138	0.741	1.232	0.498	1.158	0.828
BII2	0.480	0.471	0.947	0.804	0.843	0.508	0.709	0.403	0.769	0.466
BII3	0.272	0.849	1.215	0.808	1.201	0.393	0.344	0.360	0.734	0.768
BIR1	0.427	0.713	1.559	1.051	1.369	0.710	0.978	0.563	1.431	0.892
BIR2	0.439	0.692	1.146	0.749	1.005	0.314	0.677	0.526	0.866	0.815
BIR3	0.447	0.651	1.696	0.988	1.298	0.786	1.038	0.582	1.358	0.924
BE1	0.176	0.307	0.620	0.356	0.602	0.187	0.343	0.201	0.546	0.386
BE2	0.019	0.195	0.550	0.292	0.509	0.148	0.341	0.082	0.445	0.293
BI1	0.201	0.380	0.674	0.355	0.641	0.168	0.175	0.188	0.553	0.303
BI2	0.157	0.295	0.585	0.419	0.533	0.275	0.295	0.120	0.425	0.210
BR1	0.208	0.178	0.598	0.326	0.638	0.212	0.321	0.145	0.525	0.279
BR2	0.141	0.217	0.471	0.284	0.434	0.186	0.295	0.080	0.354	0.220

	BIE2	BIE3	BII1	BII2	BII3	BIR1	BIR2	BIR3	BE1	BE2
BIE2	1.958									
BIE3	1.105	1.771								
BII1	0.920	0.989	2.041							
BII2	0.720	0.745	0.914	1.561						
BII3	0.772	0.696	0.685	0.516	1.348					
BIR1	1.179	1.083	1.241	0.793	0.918	1.777				
BIR2	0.809	0.763	0.746	0.600	0.731	0.952	1.307			
BIR3	1.056	1.097	1.183	0.771	0.852	1.288	0.952	1.832		
BE1	0.487	0.504	0.467	0.303	0.324	0.534	0.320	0.468	0.421	
BE2	0.349	0.397	0.314	0.187	0.203	0.371	0.238	0.339	0.250	0.325
BI1	0.375	0.423	0.432	0.360	0.379	0.461	0.317	0.418	0.338	0.195
BI2	0.308	0.286	0.435	0.263	0.264	0.325	0.196	0.329	0.216	0.189
BR1	0.321	0.302	0.458	0.256	0.253	0.385	0.335	0.470	0.217	0.197
BR2	0.314	0.287	0.367	0.205	0.222	0.319	0.249	0.356	0.189	0.187

	BI1	BI2	BR1	BR2
BI1	0.446			
BI2	0.224	0.352		
BR1	0.207	0.234	0.459	
BR2	0.168	0.252	0.263	0.316

APPENDIX IV

HSRC PUBLICATION LIST

A complete list of HSRC publications or a list of publications of a particular Institute of the HSRC is available from the Head: Technical Services

HUMAN SCIENCES RESEARCH COUNCIL
RAAD VIR GEESTESWETENSKAPLIKE NAVORSING

Functions of the HSRC

The HSRC undertakes, promotes, supports and co-ordinates research in the field of the human sciences. It also determines research priorities, disseminates the findings of human sciences research, facilitates and evaluates the implementation of research findings, stimulates the training of researchers, places the full spectrum of human sciences disciplines at the service of the inhabitants of the RSA and promotes science in general.

Institutes

Institute for Communication Research (ICOMM)

Institute for Educational Research (IER)

Institute for Historical Research (IHR)

Institute for Manpower Research (IMAN)

National Institute for Personnel Research (NIPR)

Institute for Psychological and Edumetric Research (IPER)

Institute for Research Development (IRD)

Institute for Research into Language and The Arts (IRLA)

Institute for Sociological and Demographic Research (ISODEM)

Institute for Statistical Research (ISR)

Bureau for Research Support Services (BRSS)

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Funksies van die RGN

Die RGN onderneem, bevorder, ondersteun en koördineer navorsing op die gebied van die geesteswetenskappe, bepaal navorsingsprioriteite, versprei die resultate van geesteswetenskaplike navorsing, vergemaklik en evalueer die implementering van die resultate van navorsing, stimuleer die opleiding van navorsers, stel die volle spektrum van dissiplines in die geesteswetenskappe ten diens van die inwoners van die RSA en bevorder die wetenskap in die breë.

Institute

Instituut vir Geskiedenisnavorsing (IGN)

Instituut vir Kommunikasienavorsing (IKOMM)

Instituut vir Mannekragnavorsing (IMAN)

Instituut vir Navorsingsontwikkeling (INO)

Instituut vir Opvoedkundige Navorsing (ION)

Nasionale Instituut vir Personeelnavorsing (NIPN)

Instituut vir Psigologiese en Edumetriese Navorsing (IPEN)

Instituut vir Sosiologiese en Demografiese Navorsing (ISODEM)

Instituut vir Statistiese Navorsing (ISN)

Instituut vir Taal- en Kunstenavorsing (INTAK)

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