MACHIAVELLIANISM AS A COMPONENT IN PSYCHOTICISM AND EXTRAVERSION

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Summary—The EPQ was administered to 592 male and 562 female subjects, mainly non-students, together with a 43-item Machiavellianism scale slightly altered from the original, and with several newly written items added. Detailed factorial analyses disclosed that the M scale measured a single, clearly defined factor which correlated positively with P and E, and negatively with L; no correlations were observed with N. Correlations with P were higher for females than for males, while correlations with E were higher for males than for females. Less socially acceptable M items correlated more highly with P, more socially acceptable M items correlated more highly with E. Machiavellianism, like impulsivity, sensation seeking and venturesomeness, clearly lies in the P + E + quadrant of the 3-dimensional personality sphere.

INTRODUCTION

Eysenck's three-dimensional personality theory is basically hierarchical, the major dimensions of Psychoticism (P), Extraversion (E) and Neuroticism (N) being constructs based on the inter-correlations between more homogeneous *traits* which occupy a lower level in the factorial structure. Previous studies have investigated the position within this framework of traits such as sociability, impulsivity, sensation seeking, venturesomeness, empathy and anxiety (Eysenck & Eysenck, 1985); in the present study we have attempted to discover the position of Machiavellianism (M) (Christie & Geis, 1970; Christie & Lehman, 1970) in relation to P, E and N. Inspection of the questions used to measure M, and the theories related to this concept, led us to believe that M would be positively correlated with both P and E, and it also seemed likely that M would correlate negatively with L, the lie or dissimulation scale, in view of the negative correlation usually found between P and L.

An additional question which concerned us was the univocal nature of M. One group of studies had suggested that Machiavellianism was a unitary construct (Christie & Lehman, 1970; Kno & Marsella, 1977), while others had suggested that Machiavellianism was multidimensional (Williams, Hazelton & Renshaw, 1975; Hunter, Gerbing & Boster, 1982; Paritz, 1989). Such a question does not usually have a definitive answer, because there is no universal agreement on methods of analysis, criteria for factor extraction and number of factors retained, etc.; the criterion of eigenvalues exceeding unity to determine the number of factors in a matrix, while widely used, almost certainly exaggerates the number of factors retained, sometimes grossly so. We have the additional problems that different populations may give different results, and that student populations, which are frequently used in such studies, may differ from random samples of the population, being obviously younger, more intelligent, and less experienced in the ways of the world. Furthermore, many correlational studies use groups which are much too small to give acceptable results. Last but not least, many studies have failed to include members of both sexes, or to analyse results separately for the two sexes; this is necessary because, as will become apparent, there are important differences between males and females in their responses to M (as well as to P and N).

For all these reasons we decided to use a large (in excess of 500) group of males and females, mostly non-students but containing a sprinkling of students. Middle-class and working-class representatives were both represented, with the former accounting for more than their fair share.

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METHOD

A 143-item questionnaire was constructed containing 43 hypothesized Machiavellianism items along with the 100-items of the EPQ-R (Eysenck, Eysenck & Barrett, 1985). The revised EPQ contains 32 P items, 23 E items, 24 N items, and 21 L items. Several of the Machiavellianism items were rewritten from items of the Machiavellianism scale of Christie and Geis (1970), the items in the present study being largely phrased so as to measure the respondent's own behaviour rather than, as in the Christie and Geis scale, attitudes towards Machiavellian behaviours. Several new items were constructed relating to Machiavellian behaviours such as deceitfulness, cunning, manipulation, political manoeuvring, and, particularly, ruthlessness and power-seeking.

The questionnaire was administered to 592 males (mean age = 23.48, SD = 9.09) and 562 females (mean age = 23.86, SD = 11.29). Both groups contained a wide range of individuals. The male group included plumbers, electrical and mechanical engineers, building services technicians, carpenters, students, teachers, and managers from a wide range of functions, such as finance, marketing, personnel, and production. The female group included students, teachers, managers, secretarial students and housewives.

RESULTS

The 43 hypothesized Machiavellianism items were analysed, separately for males and females, using principal components and hyperplane maximised direct oblimin rotations (Jennrich & Sampson, 1966; Barrett & Kline, 1980). One-factor, 2-factor, and 3-factor solutions were examined. The 1-factor solutions gave easily the clearest interpretation, and 30 items loaded 0.2 or higher for both males and females. The 1-factor solutions were re-calculated using just these 30 items, and again all items loaded at least 0.2 for both males and females. These 30 items were chosen as Machiavellianism items. Table 1 shows the item wordings and the loadings for the 30-item analyses. Table 2 shows the correlations of P, E, N and L with each of the 30 Machiavellianism items.

Table 1. Machiavellianism items: wordings and loadings on Machiavellianism factor

		Loadings	
		Males	Females
3.	Do you sometimes break a promise if it is to your advantage to do so?	46	40
6.	Do you adopt the policy of not completely trusting most people?	29	30
9.	Would you be prepared to deceive someone completely if it was to your advantage to do so?	51	43
18.	Would you be prepared to do a bad turn to someone in order to get something you particularly wanted for yourself?	54	48
21.	Do you tend to assume that all people have a vicious streak and it will come out when they are given a chance?	30	38
27.	Do you often act in a cunning way in order to get what you want?	49	54
36.	Would you be prepared to 'walk all over people' to get what you want?	57	59
39.	Do you adopt the policy of flattering important people in order to gain advantages for yourself?	44	45
42.	Are you willing to cut corners here and there in order to get ahead?	34	42
51.	Do you believe in never trusting anyone who has a grudge against you?	32	31
54.	Would you like to be in a position where people did exactly what you asked without question?	44	36
63.	Do you enjoy manipulating people?	51	53
66.	Do you tend to do most things with an eye to your own advantage?	55	54
69.	Do you agree that the best way to handle people is to tell them what they want to hear?	21	28
72.	Do you find that a lot of the fun in work or business is in trying to outdo someone else?	41	43
−75.	Do you agree that honesty is the best policy in all cases?	−25	−34
78.	Do you sometimes choose friends with an eye toward what they might be able to do for you?	38	35
81.	In marriage, or 'going out with' or living with a partner, would you want to be the dominant partner?	27	27
90.	Do you sometimes tell outright lies?	38	46
93.	Do you tend to bring pressure on people if you want them to do something?	38	43
96.	Do you agree that the most important thing in life is winning?	49	47
−99.	At work or business, would you prefer to get on quietly with your work rather than get involved in political manoeuvring that might get you into a better position?	−30	−43
108.	Would you be prepared to be quite ruthless in order to get ahead in your job?	57	58
111.	Do you adopt the policy of never telling anyone the real reason you did something unless it is useful to do so?	37	34
−114.	Do you agree that there is no excuse for lying to someone else?	−21	−28
117.	Would you like to be in authority over others?	35	41
−120.	Would you prefer to be humble and honest rather than important and dishonest?	−51	−48
123.	Would you like to be very powerful?	47	53
126.	Would you say that you are more concerned with making a good living than with satisfying your conscience?	47	39
129.	Would you like to be in a position where people were frightened to defy you?	47	35

Item numbers marked negatively are reverse scored (i.e. a 'No' response relates to Machiavellianism).

Table 2. Machiavellianism items: correlations with P, E, N, and L

Item number	Correlation of P, E, N, and L with the item scored in the Machiavellian direction							
	Males				Females			
	P	E	N	L	P	E	N	L
3	27	23	05	−30	19	17	07	−37
6	12	04	07	−11	07	−06	13	−03
9	27	21	−02	−28	28	08	00	−20
18	22	08	−03	−25	32	02	04	−24
21	22	13	16	−07	21	03	17	−08
27	18	21	11	−22	27	19	14	−17
36	34	16	−04	−18	26	12	00	−16
39	14	15	15	−15	15	18	13	−22
42	08	13	06	−33	23	29	04	−37
51	06	08	12	−06	10	−02	17	−05
54	10	16	11	−07	05	10	06	−10
63	22	16	−03	−17	29	16	−01	−14
66	09	19	09	−14	20	04	12	−22
69	11	07	15	00	11	−01	10	−09
72	13	16	00	−15	19	03	12	−15
−75	23	06	−07	−29	26	05	05	−31
78	14	07	13	−17	17	04	16	−14
81	05	13	−04	−09	19	13	02	−06
90	27	14	13	−39	29	11	16	−40
93	09	11	05	−25	17	22	10	−20
96	24	16	−02	−01	19	04	02	−07
−99	14	20	−15	−14	26	39	−07	−20
108	21	15	−01	−17	30	20	−01	−19
111	23	09	15	−01	19	06	11	−06
−114	−02	04	−04	−21	22	13	−07	−34
117	−07	15	−01	−17	07	29	−08	−19
−120	30	11	−12	−22	32	21	−11	−19
123	05	20	00	−18	18	24	−02	−19
126	17	19	−03	−15	23	−03	11	−09
129	32	21	10	−08	14	07	08	−03

Item numbers marked negatively are reverse scored (i.e. a 'No' response to Machiavellianism).

Table 2 shows that many of the Machiavellianism items correlate well with either one or both of P and E, while the item correlations with N are generally low. For 16 of the 30 items, the correlation with P is greater than the correlation with E for both sexes (Item numbers 3, 6, 9, 18, 21, 36, 63, 69, 75, 78, 90, 96, 108, 111, 120, 129). For 7 of the items, the correlation with E is greater than the correlation with P for both sexes (Item numbers 39, 42, 54, 93, 99, 117, 123). For the remaining 7 items, the correlation with P is higher for females, and the correlation with E is higher for males (Item numbers 27, 51, 66, 72, 81, 114, 126). All the Machiavellianism items correlate negatively with L for both sexes.

Machiavellianism scales of different lengths were formed. All 30 Machiavellianism items were used to form one scale. A 20-item scale was formed from the 20 items with the highest loadings (mean of male and female loadings) (Item numbers 3, 9, 18, 27, 36, 39, 42, 54, 63, 66, 72, 90, 93, 96, 108, 117, 120, 123, 126, 129), and a 10-item scale was formed from the 10 highest loading items (Item numbers 9, 18, 27, 36, 63, 66, 96, 108, 120, 123). The means, SDs, and Coefficient reliabilities for the 3 Machiavellianism scales, and for P, E, N and L, are shown in Table 3. The correlations of the 3 Machiavellianism scales with P, E, N and L are shown in Table 4.

The means, SDs, and reliabilities shown in Table 3 for P, E, N and L are similar to those obtained by Eysenck et al. (1985). The means for the 3 Machiavellianism scales show that males score much higher than females on Machiavellianism. The reliability coefficients for the Machiavellianism scales are high. It can be seen from Table 4 that the 3 Machiavellianism scales show similar relationships with P, E, N and L. Machiavellianism is related positively to P and E, and negatively to L. As would be expected from the correlations of P and E with the individual Machiavellianism items (Table 2), females show a markedly stronger relationship between Machiavellianism and P than between Machiavellianism and E. For males, where there are nearly as many Machiavellianism items that correlate more with E than with P as there are items that correlate more with P than with E, Machiavellianism scales show less difference in the degree to which they correlate with P and E, although all 3 scales show a stronger relationship with P.

Table 3. Means, SDs, and coefficient α reliabilities for 3 Machiavellianism scales and P, E, N, and L scales

	Males			Females		
	Mean	SD	Reliability	Mean	SD	Reliability
Machiavellianism						
30-item scale	14.40	5.85	0.83	9.58	5.33	0.83
20-item scale	9.39	4.50	0.82	5.66	3.89	0.81
10-item scale	4.15	2.64	0.75	2.02	2.13	0.75
P	7.99	4.38	0.76	5.69	3.82	0.75
E	15.90	4.94	0.85	15.20	5.01	0.85
N	10.47	5.22	0.84	13.78	5.57	0.87
L	5.95	3.53	0.73	7.04	3.67	0.74

Table 4. Correlations of Machiavellianism scales with P, E, N, and L

	P	E	N	L
30-item scale				
Males	0.40	0.34	0.09	−0.41
Females	0.48	0.28	0.15	−0.43
20-item scale				
Males	0.38	0.34	0.06	−0.40
Females	0.45	0.30	0.11	−0.13
10-item scale				
Males	0.38	0.29	−0.01	−0.13
Females	0.45	0.24	0.05	−0.12

There is virtually no relationship between Machiavellianism and N, but L is as strongly related negatively to Machiavellianism as P is related positively. The relationship of L to Machiavellianism is discussed later.

If we consider Machiavellianism items where a low percentage of people admit to the behaviour as being 'unacceptable', and items where a high percentage of people admit to the behaviour as being 'acceptable', it is interesting to consider the item correlations with P and E in relation to the 'acceptability' of the Machiavellian behaviour. Tables 5 and 6 show for males and females the correlations with P and E of different groups of Machiavellianism items. The tables also show the percentage of respondents scoring in the Machiavellianism direction for each item. There are 3 groups of Machiavellianism items for each sex. For males, there are (1) items where 60% plus of respondents score in the Machiavellianism direction, (2) items where 40–59% of respondents score in the Machiavellianism direction, and (3) items where 20–39% of respondents score in the Machiavellianism direction. For females, there are (1) items where 40% plus of respondents score in the Machiavellianism direction, (2) items where 20–39% of respondents score in the

Table 5. Machiavellianism items: correlations with P and E and percentage of respondents scoring in the Machiavellianism direction (males)

Items where 60% plus of respondents score in the Machiavellianism direction				Items where 40–59% of respondents score in the Machiavellianism direction				Items where 20–39% of respondents score in the Machiavellianism direction			
E correlation > P correlation				E correlation > P correlation				E correlation > P correlation			
Item	P	E	%	Item	P	E	%	Item	P	E	%
42	08	13	77	27	18	21	55	39	14	15	39
51	06	08	68	54	10	16	43	72	13	16	38
66	09	19	63	81	05	13	53				
93	09	11	61	−99	14	20	43				
−114	−02	04	67	126	17	19	56				
117	−07	15	80								
123	05	20	65								
P correlation > E correlation				P correlation > E correlation				P correlation > E correlation			
Item	P	E	%	Item	P	E	%	Item	P	E	%
3	27	23	60	9	27	21	42	18	22	08	28
6	12	04	68	21	22	13	40	36	34	16	25
				69	11	07	42	63	22	16	32
				−75	23	06	53	78	14	07	30
				90	27	14	42	96	24	16	34
				108	21	15	41	111	23	09	37
								−120	30	11	29
								129	32	21	28

Correlations are with the item scored in the Machiavellianism direction. Item numbers marked negatively are reverse scored (i.e. a 'No' response relates to Machiavellianism).

Table 6. Machiavellianism items: correlations with P and E and percentage of respondents scoring in the Machiavellianism direction (females)

Items where 40% plus of respondents score in the Machiavellianism direction				Items where 20–39% of respondents score in the Machiavellianism direction				Items where fewer than 20% score in the Machiavellianism direction			
E correlation > P correlation				E correlation > P correlation				E correlation > P correlation			
Item	P	E	%	Item	P	E	%	No items			
42	23	29	66	39	15	18	22				
93	17	22	45	54	05	10	29				
−99	26	39	41	123	18	24	34				
117	07	29	60								
P correlation > E correlation				P correlation > E correlation				P correlation > E correlation			
Item	P	E	%	Item	P	E	%	Item	P	E	%
3	19	17	54	9	28	08	21	18	32	02	11
6	07	−06	65	21	21	03	30	36	26	12	07
51	10	−02	60	27	27	19	35	63	29	16	17
−75	26	05	47	66	20	04	38	72	19	03	18
−114	22	13	60	69	11	−01	31	78	17	04	14
				90	29	11	32	81	19	13	19
				111	19	06	26	96	19	04	10
				126	23	−03	29	108	30	20	19
								−120	32	21	11
								129	14	07	09

Correlations are with the item scored in the Machiavellianism direction. Item numbers marked negatively are reverse scored (i.e. a 'No' response relates to Machiavellianism).

Machiavellianism direction, and (3) items where fewer than 20% of respondents score in the Machiavellianism direction.

For males, there are 9 of the most 'acceptable' items where 60% plus of respondents score in the Machiavellianism direction. All but 2 of these items have a higher correlation with E than with P, although in several cases both correlations are low. Items with a reasonable correlation with E are No. 66 "Do you tend to do most things with an eye to your own advantage?", No. 117 "Would you like to be in authority over others?", and No. 123 "Would you like to be very powerful?" Of the two items where the P correlation is greater than the E correlation, one item has low correlations with both P and E, and the other relates well to both P and E. This is No. 3, "Do you sometimes break a promise if it is to your advantage to do so?" Of the items that are intermediate in 'acceptability', where 40–59% of respondents score in the Machiavellianism direction, 5 have higher E correlations, and 6 have higher P correlations. When we look at the 'unacceptable' items, where only 20–39% of respondents score in the Machiavellianism direction, only 2 items have E correlations greater than P correlations, while 8 items have a higher P correlation. Of these 8 items, all but one have a P correlation of at least 0.2. The 7 items with a P correlation of at least 0.2 are No. 18 "Would you be prepared to do a bad turn to someone in order to get something you particularly wanted for yourself?", No. 36 "Would you be prepared to 'walk all over people' to get what you want?", No. 63 "Do you enjoy manipulating people?", No. 96 "Do you agree that the most important thing in life is winning?", No. 111 "Do you adopt the policy of never telling anyone the real reason you did something unless it is useful to do so?", No. 120 (reverse scored) "Would you prefer to be humble and honest rather than important and dishonest?", and No. 129 "Would you like to be in a position where people were frightened to defy you?"

For the Machiavellianism items, a lower percentage of females than of males score in the Machiavellianism direction. In some cases the difference is very marked. For most of those items where only about 30% of males score in the Machiavellianism direction, only about 10% of females score in that direction (Item numbers 18, 36, 78, 96, 120, 129). The Machiavellian behaviours are less 'acceptable' for females in the sense that fewer females engage in them. The more acceptable items, where 40% plus of female respondents score in the Machiavellianism direction, consist of 4 items where the E correlation is greater than the P correlation, and 5 items where the P correlation is greater than the E correlation. Of the items that are intermediate in 'acceptability', where 20–39% of female respondents score in the Machiavellianism direction, 8 items have a higher correlation with P than with E, while only 3 items have a higher correlation with E than with P. There are 10 'unacceptable' items, where fewer than 20% of female respondents score in the Machiavellianism direction, and all of these items have a higher correlation with P than with E.

In comparison to males, females provide more Machiavellianism items that relate to P rather than to E. This can be related to the lower 'acceptability' of Machiavellian behaviour among females. Tables 5 and 6 show that 21 items are scored in the Machiavellianism direction by fewer than 40% of females, whereas only 10 items are scored in the Machiavellianism direction by fewer than 40% of males. Of the 21 female items, 18 have higher correlations with P than with E, and of the 10 male items, 8 have higher correlations with P than with E. For both males and females, the more 'unacceptable' Machiavellian behaviours are clearly related to P rather than E.

Analyses were undertaken, separately for each sex, using principal components and hyperplane maximised direct oblimin rotations (Jennrich & Sampson, 1966; Barrett & Kline, 1980) on the 130-item matrix consisting of the 100 items representing P, E, N and L, and the 30 Machiavellianism items. The matrix was analysed in terms of 3-, 4- and 5-factor rotations. For comparison, a 4-factor rotation, for each sex, was undertaken on the 100-item matrix of P, E, N and L items producing P, E, N and L factors.

The 130-item 5-factor solution produced, for both males and females, factors that were clearly P, E, N, L and Machiavellianism. The Kaiser coefficients of factor similarity (Kaiser, Hunka & Bianchini, 1969) between the sexes were 0.98 for P, 0.99 for E, 1.00 for N, 0.98 for L, and 0.98 for Machiavellianism.

The 130-item 4-factor solutions produced factors that were more complex to interpret. Broadly, for both sexes, there was, in addition to E and N factors, one factor mixing P and Machiavellianism, and another factor mixing Machiavellianism with −L (i.e. L items scored in the low L direction). The factors were not as 'clean' as for the 5-factor solution discussed above, or for the 3-factor solution discussed below. The Kaiser coefficients of factor similarity between the sexes were 0.91 for E, 0.93 for N, 0.90 for P/Mach, and 0.92 for −L/Mach. The loadings of the 30 Machiavellianism items on these 4 factors (P/Mach, −L/Mach, E and N) are shown in Table 7. For males, 12 of the 30 Machiavellianism items had their highest loading on the P/Mach factor, 8 of the Machiavellianism items had their highest loading on the −L/Mach factor, 2 of the Machiavellianism items had their highest loading on the E factor, and 3 of the Machiavellianism items had their highest loading on the N factor. Five items had joint highest loadings. For females,

Table 7. Machiavellianism items: loadings on 4-factor solutions from 130-item factor analyses (P, E, N, L, and Machiavellianism items)

	Males				Females			
Item	P/Mach	−L/Mach	E	N	P/Mach	−L/Mach	E	N
3	26	26	22	07	14	31	19	11
6	15	13	06	12	36	−08	−04	12
9	34	30	16	−03	31	24	04	−05
18	35	33	03	−05	38	29	−06	−05
21	26	−10	24	26	42	−02	03	16
27	18	24	22	16	46	06	21	11
36	47	19	11	−03	53	07	09	−07
39	21	10	19	24	31	09	23	15
42	−03	46	08	06	14	32	30	08
51	10	03	18	21	35	−05	−01	14
54	21	−05	32	26	40	−15	13	07
63	30	23	13	01	48	07	11	−08
66	16	13	30	18	46	08	05	09
69	17	−15	17	26	32	−03	−03	11
72	20	14	18	06	44	01	03	09
−75	−21	−40	10	16	−08	−44	00	−01
78	19	19	06	17	30	09	02	12
81	02	17	15	−02	28	−01	12	−04
90	22	42	05	12	22	41	09	14
93	05	44	01	03	30	09	24	10
96	39	−04	23	05	50	−06	03	−04
−99	−15	−18	−17	18	−24	−16	−40	09
108	31	28	11	−02	47	11	17	−08
111	35	−11	19	27	40	−06	07	10
−114	05	−41	06	11	00	−46	−06	10
117	−10	33	15	01	23	03	33	−08
−120	−43	−29	−01	16	−33	−23	−14	20
123	09	24	24	05	41	02	27	−04
126	26	09	24	06	41	04	−05	02
129	40	−03	28	19	46	−13	06	03

Item numbers marked negatively are reverse scored (i.e. a 'No' response relates to Machiavellianism).

23 of the Machiavellianism items had their highest loading on the P factor, 5 on the L factor, 2 on the E factor, and none on the N factor. There were no joint highest loadings.

The loadings of the Machiavellianism items on the P/Mach and −L/Mach factors correspond to the correlations of the Machiavellianism items with P and L given in Table 2. The Machiavellianism items that have their highest loading on the −L/Mach factor tend to be items that correlate negatively with L more than they correlate positively with P. They tend to be the more 'acceptable' Machiavellianism items that are endorsed by a high proportion of people. The 8 items for males with their highest loading on the −L/Mach factor are No. 21 endorsed by 40%, No. 42 by 77%, No. 75 (reverse scored) by 53%, No. 81 by 53%, No. 90 by 42%, No. 93 by 61%, No. 114 (reverse scored) by 67%, and No. 117 by 80%. The 5 items for females with their highest loading on the −L/Mach factor are No. 3 endorsed by 54%, No. 42 by 66%, No. 75 (reverse scored) by 47%, No. 90 by 32%, and No. 114 (reverse scored) by 60%. If we consider the L scale to be acting as an accurate measure of conforming behaviour rather than as a lie scale, then the results make good sense. As Table 2 shows, most Machiavellian behaviours are related both to non-conforming behaviours as measured by low L scores, and to high P scores. Machiavellianism items that are more related to the milder sorts of non-conformity measured by low L scores, rather than to the more extreme behaviours measured by high P scores, have emerged on the −L/Mach factor rather than the P/Mach factor in the 4-factor rotation.

The 130-item 3-factor solution produced, for both sexes, a factor for E, a factor for N, and a factor mixing P and Machiavellianism. The P/Mach factor also contained a few L items scored in the low L direction. (The loadings of the L items are discussed later in this section.) The Kaiser coefficients of factor similarity between the sexes were 0.99 for E, 0.99 for N, and 0.99 for P/Mach. On the P/Mach factor, for both males and females, P items showed a similar pattern of loadings to the 100-item (P, E, N and L items) P factor. The loadings of the 30 Machiavellianism items on the 3 factors of the 130-item 3-factor solution (P/Mach, E and N factors) are given in Table 8. For males, 26 of the Machiavellianism items have their highest loading on the P/Mach factor, 2 of the Machiavellianism items have their highest loading on the E factor, and 1 Machiavellianism item has its highest loading on the N factor. One Machiavellianism item has its highest loading

Table 8. Machiavellianism items: loadings on 3-factor solutions obtained from 130-item factor analyses (P, E, N, L, and Machiavellianism items)

Item	Males			Females		
	P/Mach	E	N	P/Mach	E	N
3	42	18	00	30	24	12
6	24	03	08	26	−10	12
9	47	12	−10	42	04	−02
18	47	01	−12	51	−05	−01
21	30	11	18	35	−03	17
27	36	20	11	42	16	12
36	54	01	−13	51	03	−05
39	33	13	18	31	21	16
42	23	18	07	31	35	09
51	19	13	18	26	−06	15
54	29	21	19	25	04	06
63	41	08	−06	47	06	−07
66	31	25	12	45	00	11
69	18	07	20	25	−08	12
72	29	14	01	38	−03	10
−75	−34	06	18	−35	−09	−05
78	32	03	12	31	00	13
81	13	17	−03	23	08	−04
90	44	07	07	44	15	17
93	26	09	03	30	22	10
96	39	09	−05	41	−05	−04
−99	−21	−16	21	−30	−39	10
108	44	07	−08	48	13	−06
111	36	04	17	30	00	10
−114	−12	−05	08	−30	−16	07
117	10	23	03	21	30	−08
−120	−50	04	24	−45	−14	18
123	25	24	03	37	21	−04
126	34	17	−01	39	−09	04
129	45	13	08	31	−03	02

Item numbers marked negatively are reverse scored (i.e. a 'No' response relates to Machiavellianism).

on both P and N. For females, 27 Machiavellianism items have their highest loading on the P/Mach factor, and the other 3 Machiavellianism items have their highest loading on the E factor.

Similar results were obtained by undertaking 3-factor solutions on the 109-item matrix consisting of P, E, N and Machiavellianism items (the 130-item matrix excluding the 21 L items). For both males and females, factors were obtained for E and N, and also a factor mixing P and Machiavellianism. The Kaiser coefficients of factor similarity between the sexes were 0.98 for E, 0.98 for N, and 0.97 for P/Mach. (Four-factor solutions on the 109-item matrix produced factors that were clearly P, E, N and Machiavellianism. The Kaiser coefficients of factor similarity between the sexes were 0.97 for P, 0.98 for E, 0.99 for N, and 0.98 for Machiavellianism.) As was the case for the 130-item 3-factor solution, P items showed a similar pattern of loadings on the 109-item P/Mach factor, for both males and females, as on the 100-item (P, E, N and L items) P factor. The loadings of the 30 Machiavellianism items on the 3 factors (P/Mach, E, and N) are shown in Table 9. For males, 17 of the Machiavellianism items had their highest loadings on the P/Mach factor, 7 of the Machiavellianism items had their highest loadings on the E factor, and 5 of the Machiavellianism items had their highest loadings on the N factor. One Machiavellianism item had an equally high loading on both the P/Mach and the E factor. For females, 27 Machiavellianism items had their highest loading on the P/Mach factor, and the other 3 Machiavellianism items had their highest loading on the E factor.

Both the 130-item 3-factor solutions (Table 8) and the 109-item 3-factor solutions (Table 9) suggest Machiavellianism items that could be included in the P scale. Some of the Machiavellianism items fall more clearly on the P/mach factor in the 130-item analyses, and the 130-item analyses suggest more Machiavellianism items as possible P items than do the 109-item analyses. Possible items, suggested by both the 130-item analyses and the 109-item analyses, are numbers 9, 18, 36, 63, 75, 90, 96, 108, 120 and 129. These 10 items include 7 that were selected for the 10-item Machiavellianism scale because of their high loadings on the Machiavellianism factor (Item numbers 9, 18, 36, 63, 96, 108, 120), and 2 items that were selected for the 20-item Machiavellianism scale (Item numbers 90, 129). Tables 5 and 6 show that they are all items where correlations with P exceed correlations with E, and that they tend to be less 'acceptable' items endorsed by fewer

Table 9. Machiavellianism items: loadings on 3-factor solutions obtained from 109-item factor analyses (P, E, N, and Machiavellianism items)

Item	Males			Females		
	P/Mach	E	N	P/Mach	E	N
3	32	27	10	29	20	11
6	18	08	14	26	−07	16
9	41	21	01	42	04	−01
18	44	09	−02	50	−07	−01
21	20	19	27	36	01	21
27	24	27	19	44	19	17
36	52	14	01	52	04	−02
39	22	20	25	32	21	18
42	12	19	09	31	32	09
51	09	18	23	27	−03	18
54	16	29	27	25	07	09
63	37	17	04	48	07	−04
66	18	33	20	45	01	12
69	09	12	26	25	−06	14
72	23	20	07	38	−01	12
−75	−34	01	12	−34	−04	−02
78	24	09	20	31	00	15
81	10	20	01	24	10	00
90	33	13	15	43	11	15
93	20	11	07	32	21	12
96	37	20	08	41	−02	00
−99	−21	−21	16	−32	−40	06
108	40	17	03	49	14	−03
111	27	14	28	31	04	14
−114	−10	−05	09	−27	−10	11
117	03	23	03	22	30	−06
−120	−53	−06	11	−45	−13	16
123	16	29	08	39	22	−01
126	27	25	08	39	−07	07
129	36	26	22	33	01	07

Item numbers marked negatively are reverse scored (i.e. a 'No' response relates to Machiavellianism).

Table 10. L items: factor loadings, correlations with Machiavellianism and P, and percentage responses (males)

Item	130-item factor loadings (1)			100-item L loading (2)	Correlations		% in low L direction (5)
	P/Mach	E	N		(3) Mach	(4) P	
−5	27	02	06	−35	19	09	37
−14	26	−03	04	−52	19	09	71
22	−30	−04	−02	19	22	18	51
−28	37	07	07	−28	31	16	48
34	01	−05	00	50	−01	−05	83
−40	10	13	09	−48	09	04	83
−47	20	15	08	−40	18	06	60
58	−11	−13	−02	31	08	08	80
−65	11	08	03	−43	08	05	86
−73	09	25	14	−31	17	−06	76
−79	13	17	11	−47	15	05	93
−85	13	10	01	−39	13	07	72
92	−03	01	05	24	02	−01	75
−98	26	27	08	−33	30	11	81
−106	39	13	00	−57	36	19	72
−115	28	17	−05	−19	26	22	73
−122	13	08	−01	−41	15	03	85
128	−21	−05	−10	35	19	04	71
−132	01	03	−06	−38	03	02	81
−136	01	14	13	−37	04	−01	89
141	−28	11	−01	32	16	16	39

The table shows (1) Loadings on 3-factor solution from 130-item factor analysis (P, E, N, L, and Machiavellianism items), (2) Loading on 100-item 4-factor solution L factor, (3 and 4) Correlations of 30-item Machiavellianism scale and P scale with the L item scored in the low L direction, and (5) Percentage of respondents scoring in the low L direction. The wordings of the L items are not given, but the items are identical to and in the same order as the L items given by Eysenck, Eysenck and Barrett (1985). Item numbers marked negatively are reverse scored (i.e. a 'No' response relates to L).

respondents than some of the other Machiavellianism items. The reason for the 130-item analyses, in comparison with the 109-item analyses, suggesting more Machiavellianism items as possible P items will be discussed after we have considered the loadings of the L items on the 130-item analyses.

The loadings of the 21 L items on the 3 factors of the 130-item 3-factor solution are shown in Table 10 for males and Table 11 for females. The tables also show, for each L item, the loading on the 100-item 4-factor solution L factor, the correlation between the item scored in the low L

Table 11. L items: factor loadings, correlations with Machiavellianism and P, and percentage responses (females)

Item	130-item factor loadings (1)			100-item L loading (2)	Correlations		% in low L direction (5)
	P/Mach	E	N		(3) Mach	(4) P	
−5	27	09	16	−33	23	16	28
−14	23	11	19	−51	23	08	66
22	−30	−15	−10	40	32	20	42
−28	21	09	23	−32	20	11	37
34	03	−11	−17	31	03	01	90
−40	19	−02	11	−33	14	06	74
−47	20	26	09	−36	20	19	53
58	−05	−20	−09	39	05	08	73
−65	14	21	18	−46	16	10	80
−73	11	30	11	−37	19	07	70
−79	01	23	14	−37	09	01	96
−85	10	25	10	−40	08	16	72
92	−08	−07	05	29	05	09	77
−98	23	24	12	−47	23	18	58
−106	36	19	10	−42	35	24	52
−115	41	05	02	−27	35	32	50
−122	09	19	12	−33	16	04	89
128	−18	−10	−20	44	17	11	75
−132	06	12	−05	−37	01	09	79
−136	−03	21	21	−37	07	00	94
141	−16	−02	−24	43	16	05	43

The table shows (1) Loadings on 3-factor solution from 130-item factor analysis (P, E, N, L, and Machiavellianism items), (2) Loading on 100-item 4-factor solution L factor, (3 and 4) Correlations of 30-item Machiavellianism scale and P scale with the L item scored in the low L direction, and (5) Percentage of respondents scoring in the low L direction. The wordings of the L items are not given, but the items are identical to and in the same order as the L items given by Eysenck, Eysenck and Barrett (1985). Item numbers marked negatively are reverse scored (i.e. a 'No' response relates to L).

direction and the 30-item Machiavellianism scale, the correlation between the item scored in the low L direction and the P scale, and the percentage of respondents scoring in the low L direction. For males, 12 of the L items have their highest loading on the P/Mach factor, 7 of the L items have their highest loading on the E factor, and the other 2 L items have their highest loading on the N factor. For females, 7 of the L items have their highest loading on the P/Mach factor, 9 of the L items have their highest loading on the E factor, and 4 of the L items have their highest loading on the N factor. One item shares its highest loading with the E and N factors. Thus, the L items mainly fall on the P/Mach and E factors, loading in the opposite direction to their loading on the 100-item 4-factor rotation L factor.

Tables 10 and 11 show that the higher loadings for the L items tend to be on the P/Mach factor. A few of the L items (scored in the opposite direction) would be contenders for inclusion on a P/Mach scale because of their relatively high loadings on the P/Mach factor and relatively low loadings on E and N. Possible items would be No. 5 "Have you ever taken the praise for something you knew someone else had really done?", No. 22 (reverse scored) "If you say you will do something, do you always keep your promise no matter how inconvenient it might be?" No. 106 "Have you ever taken advantage of someone?", and No. 115 "Would you dodge paying taxes if you were sure you could never be found out?" Most L scale items are answered in the low L direction by the large majority of individuals. These 4 possible P/Mach items were answered in the low L direction (or high P/Mach direction) by, for No. 5, 37% of males and 28% of females, for No. 22, 51% of males and 42% of females, for No. 106, 72% of males and 52% of females, and for No. 115, 73% of males and 50% of females. Thus, they tend to be items representing behaviours that are fairly 'acceptable' in that reasonable percentages of the population engage in them, but they are not so 'acceptable' that nearly everyone engages in them as is the case with behaviours represented by items scored in the low L direction on several of the L scale items. One L item (No. 73, but scored in the low L direction) could be a contender for inclusion on the E scale. This item is "Do you sometimes boast a little?" suggesting that extraverts are more prone to boasting than introverts. The 130-item 3-factor solution analyses (Tables 8, 10, 11) suggest that high P behaviours, high Machiavellianism behaviours, and some low L behaviours link together to form a 'P' factor (the factor we have called P/Mach). This can be understood in terms of the intercorrelations of P, Machiavellianism, and L. In addition to Machiavellianism being correlated positively with P and negatively with L, P and L are negatively correlated. In this study the PL correlation was −0.19 for males, and −0.30 for females. In the Eysenck, Eysenck and Barrett (1985) study, the correlation was −0.34 for males and −0.16 for females. If we consider just the 130-item analyses, these suggest that there are several other Machiavellianism items that could be included in the P scale. Possible items are numbers 3, 6, 21, 27, 39, 54, 66, 72, 78, 93, 111 and 126. It can be seen (Tables 2, 5, 6) that some of these items correlate with E more than with P, particularly for males. Fives of the items (3, 6, 21, 78, 111) correlate more with P than with E for both sexes, 4 of the items (27, 66, 72, 126) correlate more with P than with E for females, but more with E than with P for males, and 3 of the items (39, 54, 93) correlate more with E than with P for both sexes. All 12 items correlate positively with P in both sexes, but they also correlate negatively with L (Table 2). Because these Machiavellianism items are related both positively to P and negatively to L, they link together on the P/Mach factor (which incorporates some L items loading in the low L direction) even when they correlate more with E than with P. If the P scale was broadened to include a subscale of Machiavellianism, and possibly also a subscale of non-conformity, perhaps represented in part by L items scored in the low direction, the Machiavellianism items would have higher correlations with this new P scale.

We have seen that the more 'unacceptable' Machiavellianism items, representing behaviours engaged in by lower percentages of people, tend to correlate more with P than with E, while some of the more 'acceptable' Machiavellianism items, representing behaviours engaged in by higher percentages of people, tend to correlate more with E than with P. The additional Machiavellianism items suggested as possible P items by the 130-item analyses cover a broader range of 'acceptability' than the Machiavellianism items suggested as possible P items by both the 109-item analyses and the 130-item analyses. The 10 Machiavellianism items suggested as possible P items by both sets of analyses tend to be the more 'unacceptable' items. For males, Table 5 shows that 6 of the items (18, 36, 63, 96, 120, 129) are in the most 'unacceptable' group where 20–39% of respondents

score in the Machiavellianism direction, while the other 4 items (9, 75, 90, 108) are in the group intermediate in 'acceptability' where 40–59% of respondents score in the Machiavellianism direction. For females, Table 6 shows that 7 of the items (18, 36, 63, 96, 108, 120, 129) are in the most 'unacceptable' group where fewer than 20% of respondents score in the Machiavellian direction, while 2 items (9, 90) are in the group intermediate in 'acceptability' where 20–39% of respondents score in the Machiavellianism direction, and one item (75) is in the most 'acceptable' group where 40% plus of respondents score in the Machiavellian direction. The 12 additional Machiavellianism items suggested as possible P items by the 130-item analyses tend to be more 'acceptable' items. For males, Table 5 shows that 4 items (3, 6, 66, 93) are in the most 'acceptable' group, 4 items (21, 27, 54, 126) are in the group intermediate in 'acceptability', and 4 items (39, 72, 78, 111) are in the most 'unacceptable' group. For females, Table 6 shows that 3 items (3, 6, 93) are in the most 'acceptable' group, 7 items (21, 27, 39, 54, 66, 111, 126) are in the group intermediate in 'acceptability', and 2 items (72, 78) are in the most 'unacceptable' group.

In essence, the situation we have is this. The more 'unacceptable' Machiavellianism items are related more strongly to the existing P scale than to the E scale, and fall clearly on a 'P' factor (the P/Mach factor in both the 130-item and the 109-item 3-factor solutions). Many of the more 'acceptable' Machiavellianism items, which are related to the existing P scale, but some of which are more strongly related to E, fall on a 'P' factor (the P/Mach factor in the 130-item 3-factor solutions) when L items are included in the analyses (the L items loading negatively on the P/Mach factor). This is because Machiavellianism items relate both positively to P and negatively to L. We suggested that the results of the 130-item 4-factor solutions (Table 7), where several Machiavellianism items loaded on the −L/Mach factor rather than the P/Mach factor, make good sense if we consider the L scale to be acting as an accurate measure of non-conforming behaviour rather than as a lie scale. Assuming that some of the L items (scored in the low L direction) are acting as a measure of non-conforming behaviour, the 130-item 3-factor solutions have resulted in a broader 'P' factor incorporating behaviours measured by the existing P scale, non-conforming behaviours measured by L items scored in the low L direction, and Machiavellian behaviours with a wide range of 'acceptability'. The 4 L items, or times measuring non-conforming behaviours (5, 22, 106, 115), indicated in Tables 10 and 11 for inclusion on the P scale are correlated with Machiavellianism and can be seen by inspection of their wordings to relate particularly to Machiavellianism. If, rather than analysing Machiavellianism in relation to P, we had been analysing another primary factor, it is possible that other L items measuring other types of non-conforming behaviour would have been indicated for inclusion on the 'P' scale.

The P scale has always had a J-shaped distribution due to many of the items having a low percentage endorsement, although this tendency has been reduced in the EPQ-R (Eysenck *et al.*, 1985). These results suggest that the introduction of more 'acceptable' items (i.e. items with reasonably high endorsement rates), such as L items scored in the low L direction or similar items to measure non-conforming behaviour, will result in other 'acceptable' items, such as the more 'acceptable' Machiavellianism items, being pulled towards the P factor. It is clear that certain Machiavellianism items will ultimately form a subscale of P, but the actual items chosen will depend on the effects of other sets of items, including non-conformity items, representing different primary factors that relate to P.

DISCUSSION

The results of the study seem to bear out our expectations. There is a strong general factor running through most of the M items, which can be measured reliably even with as few as 10 items. M correlates positively with P and E, negatively with L, as an examination of the contents and interpretation of the scales would suggest. Sex differences suggest that these correlations are higher for males as far as M and E are concerned, and higher for females as far as M and P are concerned. Thus M emerges as a trait situated in the P + E + quadrant, very much like Impulsivity, Sensation Seeking, Anti-social behaviour, and others.

There is, however, a problem in the argument which was first raised in a general form by Kimble and Posnick (1967). They argued that the assumption that personality inventory answers are determined by the *content* of the question may be erroneous, and that answers may be determined by the *formal* properties of the questions, e.g. their acceptability (as shown by the proportion of

'Yes' answers). They constructed an inventory formally similar to the Taylor manifest anxiety scale (Taylor, 1956), but lacking any reference to anxiety in the new items. In spite of this, the correlation of the MA scale with the new scale was almost as high as the test–retest reliability of the MA scale. This curious and replicated result has not received the comment and replication it deserves, but it suggests that the relation between items on the M scale and P or E may be due to properties of the items and scales unrelated to their semantic content, such as the extremeness of the items as shown by the percentage of endorsements. As we have shown, such extremeness does indeed seem to be related to the likelihood of an item being related to P or E.

Random responding may be another, possibly related feature of the performance of high P scorers, also suggested by Block (1977), Claridge (1983), and Davis (1974), but see the reply by Thompson (1975). At first sight these two possible errors would seem to pull in opposite directions, as random responding would give answers near the chance level of 50%, far removed from extreme values of 5 or 95%. But Burgess has calculated that, in order to explain the difference in mean scores between psychotics and controls, one would only need to assume that some 20% of the former were filling in the scale randomly. Kilfedder (1987) and Burgess and Kilfedder (1988) have recently calculated inconsistency scores of P, E and N, using a repeated measurement methodology. Inconsistency scores, i.e. responding differently to identical items on two occasions, was a general feature of the P, E, N and L scales for psychotics, with intercorrelations for inconsistency (I) averaging around 0.5, but less so for normals with an I mean of around 0.27. Inconsistency scores differentiated better than P scores between psychotics and normals, but less well than E and L scores. The reliability of the P scale was 0.76 for psychotics, 0.81 for normals, a quite insignificant difference. Analyses of variance and covariance, using I as covariant, reduced the differences on P between psychotics and normals to insignificance, but did not affect the E and L differences. The correlation between I and P was 0.74 for the psychotics, 0.2, (NS) for the normals. At most, then, inconsistency may be a factor for psychotic responding, but not for normal responding. As our study is concerned with normals only, the argument would not seem to invalidate our results.

In any case, the argument suffers from a possible fallacy pointed out by W. Ruch (private communication, 2 August 1989). As he points out, Burgess and Kilfedder argue that highly inconsistent Ss obtain higher P scores and less inconsistent Ss obtain lower P scores because of their respective degree of inconsistency. This argument may be reversed, however. Only high P scorers can obtain high inconsistency scores, while low P scorers cannot. A S with a P score of 2 can only obtain an I score of 0 (both items answered in the same way), 2 (one identical answer and one different), or 4 (both items answered differently). However, for a P score of 6 the upper limit for I scores is 12. Thus, the P score limits the variance of the I score. The higher P scores of the psychotics *imply* higher I scores. This tendency would have to be corrected statistically before the argument can be taken too seriously.

Can it be argued that high P scores are such *because* they tend to endorse unlikely; unfashionable and socially undesirable items, hence producing a correlation with similar items on the M scale? It is difficult to separate this tendency from the non-formal, semantic hypothesis that personality traits measured by the P and M scales show some similarity, and that these traits are socially undesirable and unfashionable. The problem is similar to the familiar one of the Authoritarian Personality: does that scale measure acquiescence or authoritarianism? A special experiment to settle the question would correlate the P scale with a scale consisting of items having a similar probability of endorsement, but content quite dissimilar to psychoticism. Such items might be difficult to write, as very unusual behaviours tend to be characteristic of psychotics.

We may conclude that extreme responding and inconsistency, two related response sets, are unlikely to account for our results, although they may be relevant to the response patterns obtained by psychotics. There does seem to be a sub-set of respondents who share behaviour patterns measured by the P scale with Machiavellian attitudes of deceitfulness, cunning, manipulation, ruthlessness and power seeking. Psychologically P and M types of behaviour seem to be sufficiently related to support such a conclusion, as well as the relation between E and, for items stressing social influence and power. It would seem that Machiavellianism is an important factor in P, and less so E, types of behaviour. Roughly half of the variance in M is explained in terms of P, E and L, leaving a reasonable specific contribution to the measurement of these major dimensions of personality.

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