

The Stereotypical Scientist

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Do schoolboys regard the scientist as dull? A recent study may be relevant.

At the age of 15 or 16 most able English schoolboys face a choice between the arts and sciences. Boys who specialize in science are known to differ both intellectually and in personality from those who specialize in the arts^{1,2}. Scientists, for example, have been found to be reticent in their expression of emotion² and to deal with personal relationships in an inhibited fashion³.

Further evidence suggests that there exist certain stereotypical beliefs about the personal characteristics of arts men and scientists. American students see the scientist as highly intelligent and masculine, but lacking in sensitivity and concern for people; as gaining satisfaction from his work, but having a shallow personal life⁴. Previous research on this topic, however, suffers a central weakness. It does not indicate whether such attitudes are shared by potential arts and science specialists alike.

The first part of the present enquiry was based on the "semantic differential"⁵. The individual rates a number of typical figures (for example, Mathematician, Poet) on pairs of adjectives (such as exciting/dull, dependable/undependable), each rating being on a seven-point scale (for example, "extremely exciting" to "extremely dull"). The sample ($n=390$) was limited to 13, 15 and 17 year old boys of high academic ability, drawn from two schools, one public boarding and one grammar.

The present data confirm the American result. The typical physical scientist emerges as entirely distinct from typical figures in the verbal arts. Table 1 shows one contrast, representative of the data as a whole: that between the Physicist and the Novelist (of twenty mean ratings given, eighteen are statistically significant: $P < 0.05$). The semantic differential also includes a number of typical women and, again, American findings are borne out. Compared, for example, with the wife of the Novelist, Doctor or Barrister, the wife of the Research Scientist is seen as dull and plain.

The sample was then broken down by academic speciality, and two sub-groups formed: (i) arts specialists, taking a sixth form course in English, history or modern languages ($n=75$), and (ii) physical science specialists, studying mathematics, physics and chemistry ($n=67$). Their responses were then compared.

Fig. 1 shows the contrast between Novelist and Physicist, as seen by arts specialists and by young physical scientists. Despite "haloes" of approval for members of their own speciality, the attitudes of the two groups are strikingly similar. Both groups agree that the Novelist is the more imaginative, warm and exciting; the Physicist the more dependable, hard and hard-working. (Of differences plotted, nineteen deviate significantly from

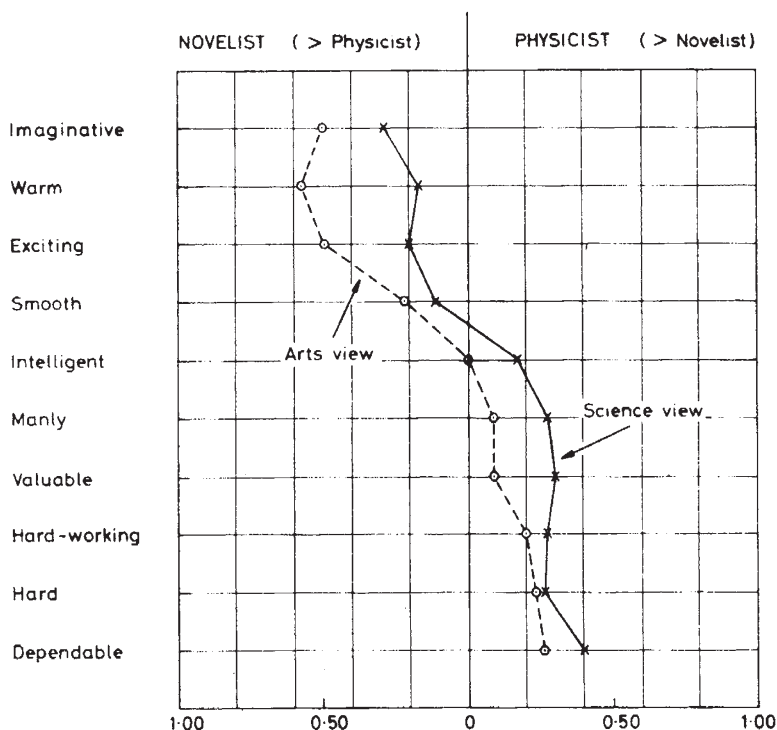


Fig. 1. Differences between "the Novelist" and "the Physicist", as seen by young arts specialists ($n=75$) and by young physical scientists ($n=67$). Each point represents a difference between two mean ratings on the semantic differential—one for "Novelist", the other for "Physicist". Differences are converted to a scale from zero to 1.00.

Table 1. QUALITIES ATTRIBUTED BY SCHOOLBOYS ($n=390$) TO TWO FIGURES: "THE NOVELIST" AND "THE PHYSICIST"

	Novelist	Physicist
Imaginative	0.86	Valuable 0.72
Warm	0.48	Intelligent 0.58
Intelligent	0.41	Hard-working 0.51
Exciting	0.38	Dull 0.32
Valuable	0.31	Dependable 0.31
Undependable	0.30	Cold 0.29
Smooth	0.19	Hard 0.28
Soft	0.19	Manly 0.27
Feminine	0.12	Rough 0.13
Lazy	0.04	Unimaginative 0.03

Mean ratings on the semantic differential converted to a scale from zero to 1.00, where zero represents the absence of a given quality, and 1.00 the maximum possible rating upon it.

zero: $P < 0.05$). Furthermore, the two groups agree closely in their rank ordering of discriminative adjectives from "warm" to "dependable" for the arts group, and from "imaginative" to "dependable" for the young scientists: $r_s = 0.88$, $P < 0.01$.

Analogous results emerge from the contrast between the wife of the Novelist and the wife of the Research Scientist. Both groups agree that, of the two, the wife of the Novelist is significantly the more exciting, feminine, soft, imaginative; while the wife of the Research Scientist is the more dependable. (In each case, $P < 0.05$.) Agreement in the rank ordering of adjectives is again high: $r_s = 0.91$, $P < 0.01$. Substantially, the relations shown in Fig. 1 hold true for boys of all academic specialities, and for all typical figures relevant to the arts/science choice. Furthermore, such stereotyped attitudes are found as pronounced among unspecialized 13 year olds as among specialists of 17.

A clear implication of these data is that adult scientists are seen by both future arts and science specialists as leading dull personal lives. It was to explore this particular inference that a "typical graduates questionnaire" was devised. A typical male arts graduate and a typical male science graduate are compared in the light of thirty characteristics, some general (such as "competitive with others") and others specific (such as "wears fashionable clothes"). Responses are on a five-point scale, ranging from "arts graduate much more likely" to "science graduate much more likely". The sample used was of similar composition to the first. Each item in the questionnaire yielding a significant rating for both arts and science specialists is given in Table 2 ($P < 0.05$). These results suggest that both groups see the typical arts graduate as the more pleasure-seeking and irresponsible figure, and the typical science graduate as the more puritanical. The agreement between the rank ordering of items is again high: for all thirty items, $r_s = 0.82$, $P < 0.01$.

It might be protested that such evidence is trivial: arts and science specialists may differ in the value they

Table 2. COMPARISON OF QUALITIES ATTRIBUTED TO THE "TYPICAL ARTS GRADUATE" AND THE "TYPICAL SCIENCE GRADUATE" BY YOUNG ARTS SPECIALISTS ($n=79$) AND BY YOUNG PHYSICAL SCIENTISTS ($n=59$)

	Young arts specialists' view	Young physical scientists' view
Arts Graduate	Wears fashionable clothes 0.62	Wears fashionable clothes 0.57
>	Sociable 0.61	Gets divorced 0.39
Science Graduate	Likes wife to look glamorous 0.52	Panics in emergencies 0.39
>	Flirts with his secretary 0.51	Flirts with his secretary 0.38
	Gambles 0.49	Sociable 0.34
	Likes expensive restaurants 0.42	Gets into debt 0.30
	Gets into debt 0.36	Gambles 0.28
	Gets divorced 0.30	Likes expensive restaurants 0.25
	Has fast car 0.23	Likes wife to look glamorous 0.23
	Panics in emergencies 0.18	
Science Graduate	Faithful to wife 0.19	Embarrassed (for example, about sex) 0.18
>	Embarrassed (for example, about sex) 0.24	Has fast car 0.23
Arts Graduate	Competitive at work 0.25	Faithful to wife 0.31
>	Works long hours 0.58	Competitive at work 0.43
		Works long hours 0.70

Mean ratings on the "typical graduates questionnaire" converted to a scale from zero to 1.00, where zero represents the absence of a given quality and 1.00 the maximum possible rating upon it.

attach to such adjectives as "warm" and "cold". Further evidence from the semantic differential refutes this. Arts and science specialists agree overwhelmingly in attributing the adjectives intelligent, imaginative, exciting, warm, dependable and valuable to figures defined in the test as "good" (for example, Good Father, Good Teacher, Good Friend).

It seems, in summary, that whatever their speciality, the attitudes of boys towards the arts and sciences are influenced by a common set of preconceptions. Psychologically, this finding is intriguing. Large numbers of boys choose careers in the physical sciences, believing as they do so that the personal life of the adult scientist is unexciting. This choice may represent a reluctant compromise, but previous research suggests that it will frequently be made gladly, and even with a sense of relief². Such stereotyped preconceptions may also help to explain why, contrary to predictions of a historical or economic nature, the proportion of able children recruited to the physical sciences in Great Britain has failed to increase since 1960 and may indeed have decreased³. It remains unclear, however, where boys' stereotyped ideas originate and to what extent they are open to change.

These results arise from a programme of research supported by the Nuffield Foundation.

¹ Hudson, L., *Brit. J. Educ. Psychol.*, **33**, 120 (1963).
² Hudson, L., *Contrary Imaginations* (Methuen, London, 1966).
³ Roe, A., *Psychological Monogr.*, **67**, No. 352 (1953).
⁴ Beardslee, D. C., and O'Dowd, D. D., in *The American College* (edit. by Sanford, N. (Wiley, London, 1962).
⁵ Osgood, C. E., Suci, G. J., and Tannenbaum, P. H., *The Measurement of Meaning* (University of Illinois, Urbana, 1957).
⁶ Phillips, C. M., *Times Educational Supplement* (November 19, 1965).

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THE NIGHT SKY IN FEBRUARY

All times are in Universal Time

MOON		CONJUNCTIONS WITH THE MOON	
New Moon	9d 11h	Venus	11d 09h, 3° N.
Full Moon	24d 18h	Mars	28d 15h, 2° N.
		Jupiter	21d 23h, 4° S.
		Saturn	12d 13h, 1° N.

PLANETS

Name	Times of rising (R) and setting (S) during the month				Mag.	D_p (10 ⁴ miles)	Zodiacal position
	R/S	Beginning	Middle	End			
Mercury	S	17h 20m	18h 55m	18h 15m	-0.5	92	Aquarius
Venus	S	18h 25m	19h 20m	20h 05m	-3.3	141	Aquarius
Mars	R	23h 40m	23h 05m	22h 20m	+0.2	90	Virgo
Jupiter	S	7h 20m	6h 20m	5h 20m	-2.1	408	Gemini
Saturn	S	21h 00m	20h 05m	19h 20m	+1.3	961	Pisces

D_p is the distance of planet from the Earth on the 15th of the month.

OCCULTATIONS OF STARS BRIGHTER THAN MAGNITUDE +6 AT GREENWICH

Star	R/D	Time	Mag.
98 Tau	D	19d 01h 50.0m	+5.6
76 Gem	D	21d 18h 43.3m	+5.4

(D, disappearance; R, reappearance)

OTHER PHENOMENA

25d 20h Uranus 3° S. of Moon