Four-Part Report on Claimed "Mars Effect"

Results of the U.S. Test of the "Mars Effect" Are Negative

Paul Kurtz, Marvin Zelen, and George Abell

Introduction

The research of Michel and Françoise Gauquelin has attracted considerable attention on both sides of the Atlantic. Although they are critics of traditional astrology, they nonetheless claim to have found a statistical correlation between the professions and personalities of certain individuals and the positions of certain planets in the sky at the time and places of their births. The alleged correlation between the position of the planet Mars in the heavens at the time of birth and the incidence of being a sports champion was taken as a test case of the Gauquelins' hypothesis.

According to the Gauquelins, if the sky is divided into 12 sectors (similar to the Placidean "houses"), Mars appears in the sectors just above

The authors would like to thank Frank Dolce, Germain Harnden, and Neal Radice for their assistance in this study.

Paul Kurtz, professor of philosophy at the State University of New York, Buffalo, is chairman of the CSICOP.
Marvin Zelen is professor of statistical science at Harvard University.
George Abell is professor of astronomy at the University of California, Los Angeles.

the eastern horizon and just west of the meridian (the first and fourth sectors) at the time of birth of sports champions more often than can be expected by chance. The Gauquelins have compiled data for a total of 2,088 European sports champions. If there is an equal probability of an athlete being born in any of the 12 sectors, then we would expect that 1/6 (approximately 16.7 percent)[1] of the athletes would be born in the key sectors. However, the Gauquelins show that in their sample this proportion is approximately 22 percent. For many years the Comité Para of Belguim investigated the Gauquelins' research but was unable to confirm it. The Gauquelins have held that the Comité Para replicated their results; the Comité, however, questioned the Gauquelins' procedure for calculating the theoretical frequency with which Mars appears in the "key" sectors at the birth times of the general population, in comparison with which the alleged deviations were found.

In 1977, Professor Marvin Zelen, a Fellow of the Committee for the Scientific Investigation of Claims of the Paranormal, proposed a new test of this Mars effect, which is now called the *Zelen test*. In Zelen's proposal the Gauquelins would select at random a subset of sports champions from their original sample and then for each champion obtain birth data for all other people born in the same areas on the same day. The plan was later modifed to select individuals born within $\pm$ 3 days of the champions. If the champions were born in the first and fourth sectors significantly more often than were the people in this new control sample, this would tend to support the Mars effect hypothesis. The Gauquelins selected names from the *chief-lieux* of the departments and provinces of France and Belgium, areas where 303 champions from the original sample were born. According to the Gauquelins, the Zelen test confirmed the Mars effect, resulting in a statistically significant difference (P = .03). (Cf. *Humanist*, Nov./Dec. 1977.)

The authors of this paper are not convinced by the Gauquelins' interpretation of the results of the Zelen test. The Mars effect was significant only in the Paris part of the sample, and was relatively weak or nonexistent for the rest of France and for Belgium. If it was a real effect, one would expect to verify the phenomenon with data from diverse geographical areas. Moreover, the Gauquelins did not employ a random selection as originally planned: They used the entire list of Paris champions but in other areas used only champions born in the chief towns. Since our 1977 report, we further learned that in the city of Paris they did not even compare champions born in each of the 20 arrondissements but only in the fourteenth arrondissement. (This was not reported in their paper and we only learned of it from the Gauquelins recently, after questioning them about it.) The reason for comparing champions and nonchampions from the same village, town, or arrondissement was to equalize any

environmental factors that might influence active participation and achievement in sports.

Our independent calculation, based only on male sports champions, resulted in a *P*-value of .04. The Gauquelins have objected to our omitting women from the analysis of sports champions. But surely women have not had the same opportunities men have had to pursue sports. It is obvious that sexual discrimination and sex roles are important factors. Accordingly, it seemed unjustifiable to compare the sample of 303 sports champions, which contained 294 males and 9 females, with the total larger population of nonchampions, which included both males and females on roughly a 50-50 basis. In our analysis using the Zelen test, therefore, we dropped the females in that sample and compared the male champions with male nonchampions only.[2]

In any case, the central issues are whether the original sample of 2,088 champions is representative of outstanding athletes in general, whether the Mars effect shown by that sample is real or a statistical fluctuation, and whether the Mars effect is an artifact of the selection process or the application of the test. Consequently, Kurtz, Zelen, and Abell, in cooperation with the Gauquelins, agreed to conduct an entirely independent study of U.S. sports champions to see if the Mars effect could be replicated.

The U.S. Test

At a meeting in July 1977, Kurtz, Zelen, Abell, and M. Gauquelin outlined plans for the U.S. test. A representative sample of U.S. sports champions was to be selected from directories of sports champions.

At the outset we did not know how much information we would obtain, e.g., whether the hour of birth was generally recorded, or whether the data would be released to us even if it were. Gauquelin himself has encountered similar difficulties in obtaining complete data from some countries. We selected all 340 American champions listed in the *Lincoln Library of Sports Champions* (Frontier Press, 1974).[3] We also selected 218 names from *Who's Who in Football* (Arlington House, 1974), primarily, but not exclusively, the players who made the All-Star or All-Pro teams, and 47 All-Star players from *Who's Who in Basketball* (Arlington House, 1973). Thus our first proposed sample was composed of a total of 605 sports champions. This total was reduced by 41 names for which birth data were not available in the directories, leaving a total of 564 names. To avoid any bias by Kurtz, Zelen, and Abell, the actual selection of the champions was made by two neutral researchers, Frank Dolce and Germain Harnden.

Once the list was compiled, we wrote to the state offices of birth

registry, pointing out the scientific character of our inquiry. Birth data were not available for many of the champions, primarily because of the newly enacted U.S. Privacy Act, which prohibits states from providing such information without the consent of the individuals themselves. Twenty-one states refused to send us information, on the basis of the Privacy Act, and five states, plus the District of Columbia and Puerto Rico, did not reply. Five states had no champions in them, and one state did not respond to our original request until six months later (those data were included in our second sample). Nevertheless, 18 states waived the rule and sent information, from which we compiled data on 128 champions. Of these 128 champions, 19.5 percent were born with Mars in key sectors. Although statistically this proportion was not significantly different from the expected 16.7 percent, we felt that the sample was too small and M. Gauquelin agreed with this judgment.

Accordingly, we decided to expand the sample by requesting information on more champions from those states that responded to our first canvass. We selected the remaining champions who resided in those states and who are listed in *Who's Who in Football* (330 names) and *Who's Who in Basketball* (145 names). This list included many All-Star and All-Pro players in basketball and football not included in the first sample. Since we had no idea initially of how much information would be forthcoming, not all the All-Star and All-Pro players were selected in the first sample. We also added the names of champions listed in *Who's Who in Track and Field* (Arlington, 1973), which contains 111 names of American champions from those states, and in *Who's Who in Boxing* (Arlington, 1974), which contains 92 such champions. We sent requests for data on these champions to the 18 cooperative states, but received replies and birth information from only 14 of them. Even those 14 states did not have records of 186 of the champions. In all, our second canvass yielded data on 197 additional champions.

In a third canvass we wrote to those states initially refusing information, and from all states we requested data on athletes listed in the directories but whose names had been omitted in the first and second canvasses. Three additional states subsequently responded to our second and third inquiries. The final number of states providing information was 22. From those cooperating states, we requested information on 682. (See Table 1.) Thus the total sample that resulted from all three canvasses contains 408 names, a number we deemed large enough for a preliminary study.

Our view has been that there should be no bias expressed by our selection process. Accordingly, requests for birth information for *all* of the sports champions listed in the various directories who were born in the states offering information were sent by Germain Harnden. According

TABLE 1

States That Sent Information on Birth Data

State	Number Requested	Number Received
Alabama	39	20
Arizona	3	2
California	175	60
Colorado	12	7
Delaware	1	1
Hawaii	4	2
Kansas	31	25
Kentucky	52	35
Nevada	2	1
New Hampshire	3	1
New Jersey	69	38
North Carolina	31	25
North Dakota	3	3
Massachusetts	20	9
Minnesota	19	17
Montana	2	2
Ohio	93	73
Oregon	25	17
South Carolina	22	14
Utah	15	15
Virginia	23	16
Wisconsin	38	25
Totals	682	408

to our understanding, they are famous sports champions because they are listed in *Who's Who*s of sports figures who have distinguished themselves in their respective sports by outstanding achievements.

Results of Statistical Analysis of American Sports Champions

Dennis Rawlins calculated the "Mars sector" of the sky corresponding to the birth time and place of each athlete for whom we received birth data. Rawlins's calculations have been spot-checked by one of us (Abell) and found to be accurate. The Gauquelins themselves have had Rawlins's calculations checked and found them accurate. The number of American sports champions born with Mars in each of the various sky sectors is shown in Table 2.

According to the Gauquelins' hypothesis, the key sectors are 1 and 4

and one would expect to find a significantly larger number of champions born with Mars in these sectors than would be expected in a random distribution. The observed proportion of births falling in the key sectors is (30 + 25)/408 = 0.135. In a population of which our sample of 408 is representative, the 95 percent confidence interval is 13.5 ± 3.3 percent. In other words, one would expect that there was only a 5 percent chance that the true percentage of births in the key sectors would lie outside the range of 10.2 to 16.8 percent.

If there were an equal chance of a birth time falling within each sector, one would expect the true proportion in sector 1 and in sector 4 to be 2/12 = 0.167. This value is barely within the 95 percent confidence interval calculated from our data. On the other hand, in Gauquelin's sample of 2,088 champions, 21.6 percent are in the key sectors. This value is clearly outside the 95 percent confidence interval of the present sample of American athletes. (The 95 percent confidence interval in Gauquelin's sample is 21.6 ± 1.8 percent.)

Since the observed proportion (13.5 percent) is less than the theoretical result (16.7 percent) if there was no "Mars effect," it is not necessary to carry out a statistical test of significance. Nevertheless, we

TABLE 2

Distribution of American Sports Champions Among 12 Celestial Sectors Relative to the Position of Mars at Birth

Sectors	Number of Champions Born in Sector
1*	30
2	39
3	35
4*	25
5	33
6	22
7	39
8	37
9	29
10	47
11	36
12	36
Total	408

* Sectors 1 and 4 are "key" sectors.

TABLE 3

Summary of Test of Significance Comparing Events in Key Sectors with Theoretical Probability of $P = 1/6$

Sectors	Observed Number in Sector	Theoretical Expectation	Observed Minus Expectation
Key (1 and 4)	55	68.0	-13.0
Other	353	340.0	13.0
Total	408		

$$\text{Chi-square} = \frac{(13)^2}{68} + \frac{(-13)^2}{340} = 2.98$$

Two-sided test: $P = .090$
One-Sided test: $P = .945$

have done so for completeness. The calculations are summarized in Table 3. If we wished to test the hypothesis that the proportion, p, is 1/6 (no relationship) against the alternative that p should be greater than 1/6, a one-sided significance test would result in a $P = .95$. That is, the data are well within what would be expected if one-sixth of all births fall in each sector. Alternatively, if we compare the hypothesis $p = 1/6$ with the alternative that p can be either greater than or less than 1/6, a two-sided test shows that the P value is .09.

Another way of examining the data is to compare the number of births in each sector with its theoretical expectation based on the condition that there was an equal chance of birth times falling within each of the 12 sectors. The theoretical expectation would then be 408/12 = 34 births in each sector. The standard chi-square test shows that in random samples from such a theoretical population we would obtain larger deviations from a uniform distribution of births among the sectors 18 percent of the time (chi-square = 14.98; 11 degrees of freedom). Hence the data are consistent with an equal chance of birth times falling within each of the 12 sectors.

We conclude that the analysis of American sports champions shows no evidence for the Mars effect.

Notes

1. Dennis Rawlins has calculated the theoretical expectations for sectors 1 and 4 to be 17.17 percent (See his article, p. 26.)

2. We have not deleted females from the U.S. test because they are not being compared with nonchampions. In the U.S. study there are 9 female sports champions, with one born in a key sector. If the women were deleted, it would not affect the results significantly.

3. One champion, Louis Groza, was inadvertently omitted from the first sample because of confusion with his brother Alex Groza; but he was added later, making a total of 341 from the *Lincoln Library*.

Report on the U.S. Test of the Gauquelins' "Mars Effect"

Dennis Rawlins

In his analysis of 2,088 European sports champions, Michel Gauquelin found that Mars appeared in a specified pair of his 12 celestial "sectors" (1 and 4) at the birth of about 22 percent (more exactly, 21.65 percent) of the sample, instead of the theoretical expectation of 17 percent (about 2 in 12; more exactly, 17.17 percent).[1]

The odds against this occurring by chance are some millions to one. Unlike Zelen, Kurtz, and Abell in their paper in the November/December 1977 *Humanist*,[2] I do not doubt the rates, analysis, or odds. Indeed, in a March 1977 memorandum, I established that Gauquelin had taken proper account of astronomical-demographic influences (they are minor, anyway—see Appendix), about which some question had been raised by CSICOP and the Comité Para.

However, because there could have been unknown problems with the European sampling (on which all previous CSICOP studies have been based), it was deemed desirable to see whether Gauquelin's prediction of 22 percent success could be verified with a fresh sample.

In 1977-78, Kurtz and aides gathered a sample of star U.S. sportsmen, of a size proportionally comparable (in depth) to the European one. The birth data were available for only 407.[2a] However, this number proved quite sufficient to test the hypothesis.

Because I had already expressed myself strongly on the subject of Gauquelin, I asked to have nothing whatever to do with the choice of a new sample.[3] However, after a while, I was retained by CSICOP to calculate

---

Dennis Rawlins's various researches have appeared in Nature, *the* American Journal of Physics, *the journals of the American Astronomical Society, Royal Astronomical Society, Norwegian Geographical Society, U.S. Naval Institute, and other publications. His address is: 2636 Grand Avenue, #212, San Diego, California 92109.*