

AMERICAN INSTITUTE for RESEARCH Inc.

DIVISION of AVIATION RESEARCH

The AMERICAN INSTITUTE for RESEARCH

A Non-profit Organization devoted to The Scientific Study of Human Resources And Their Effective Use

The American Institute for Research is established for the purpose of making scientific studies regarding human resources and their effective use. The program of the organization is based upon the fundamental assumption that by using the scientific method it is possible to discover natural laws regarding the potentialities of individuals and to discover the principles of educating and organizing groups to achieve the fullest realization of these potentialities.

AMERICAN INSTITUTE FOR RESEARCH
Cathedral of Learning
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The Aviation industry has made vast strides in advancement and improvement during its short and rapid growth. However, all too often, our airliners end like this.

The reduction of aircraft accidents is a very complex problem. There is no simple preventive formula. However, by analyzing every particle of information available, and by constantly seeking new information, aircraft accidents can—and have been—greatly reduced.

A few of the major causes of accidents are the weather as it impairs flight and obstructs visibility; failure of engines or instruments; structural failure; slippery, short, or rough runways; interference by traffic in the air and on the ground; inadequate navigational aids; and finally the pilot himself. Some of these are somewhat beyond our control; others such as new and improved equipment we have to wait for. But we can do something now about the pilot by utilizing an improved initial selection procedure.

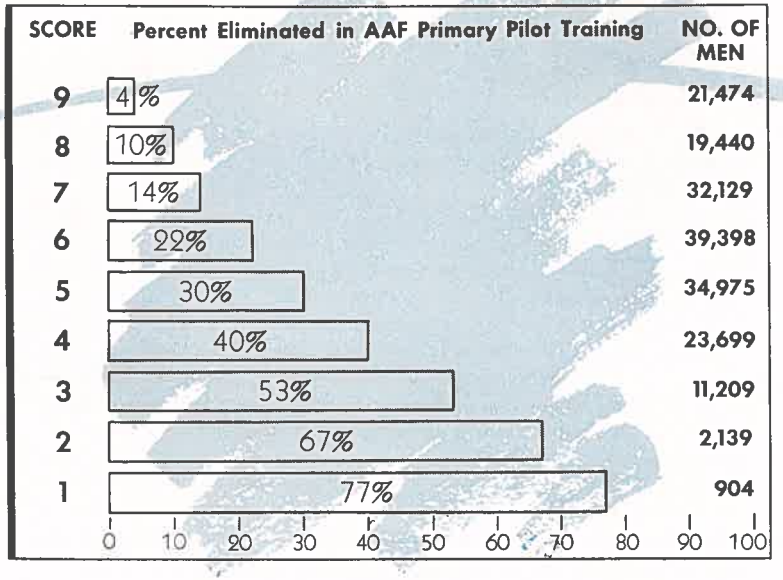
By weeding out those applicants unfitted to be commercial airline captains, costs will be reduced, lives will be saved and the high standards of pilot personnel will be maintained.

In the Army Air Forces during the war, 185,367 men, tested by aviation psychologists for pilot aptitude, were followed through training to check the prediction of these tests. The results are significant and valuable.

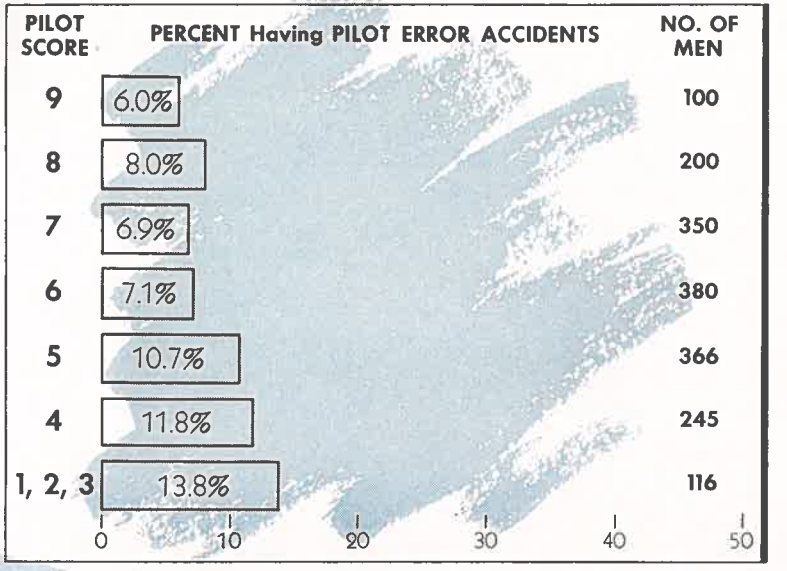
Most striking, of those applicants making a score of 9, the best score, 96 out of 100 completed primary pilot training. But of those making the score of 1, the poorest score, only 23 out of 100 completed primary pilot training.

The Army Air Forces, by training only those most likely to make good, now cuts training costs, preserves equipment, saves lives, and produces a superior pilot.

Since evidence seems to indicate that these tests measure qualities a pilot must have to be effective and safe, we believe commercial airlines may profitably use similar selection tests.



High Scoring Pilots Less Likely to have Pilot Error Accidents



In a study conducted during the war on P-38 accidents, it was found that some of the mishaps resulted from faulty equipment. In other instances a definite cause for the accident could not be determined. It is very significant that in an analysis of the accidents in which the pilot was known to have made an error the fliers with the best scores on pilot selection tests had the fewest accidents. The above graph demonstrates the point.

personnel files of five major airlines tell a pointed story

PILOTS with Similar Status with Respect to the Present Type of Personnel Data VARY WIDELY in PERFORMANCE ★

PRE-EMPLOYMENT QUALIFICATIONS





	William Weeks	Arthur Goodfield
Age	27.3	26.1
Marital Status	Married	Married
Education (Yrs.)	13.7	13.5
Flying Hours	1480.4	1489.7
Standard I.Q. Test	112	114
Standard Personality Inventory	Normal Profile	Normal Profile
Standard Mechanical Comprehension Test	82nd percentile	88th percentile

One of these applicants will not be a safe, effective pilot—but do these data tell which? Look at their records on the next page.

The data on this page represent not individual cases but the actual composite averages of the research study described on the next page. Names are fictitious.

RECORD OF SERVICE





William Weeks' Record

July 1, 1945
Not quick to learn pilot material. May turn out O. K.

December 31, 1945
Not sure of himself. Lacks initiative. Has poor coordination.

July 31, 1946
Doing better now. Can be considered captain material.

October 28, 1946
Failed to complete captain training. Not considered captain material.

Arthur Goodfield's Record

July 1, 1945
Not off to an exceptionally good start. May make the grade.

December 31, 1945
Good co-pilot. Attentive, has good flying technique.

July 31, 1946
Definitely captain material. He's the best co-pilot I've ever had.

October 28, 1946
Completed captain training. Promoted to captain.

★A research study conducted for the National Research Council Committee on Aviation Psychology by the American Institute for Research indicates that present selection requirements set up by airline companies for their pilot applicants are not sufficiently indicative of success or failure during training.

Explanation !

To be effective, selection procedures must provide an accurate evaluation of the applicant with respect to the most important requirements of the pilot's job. Certain requirements have been found to be critical because they make the difference between the effective and the ineffective pilot.

Safe and effective airline pilots possess certain critical skills and aptitudes which the usual standard tests do not measure adequately. For example, standard tests of academic intelligence which are of value in some jobs have been found not to be predictive of success or failure on the pilot's job.

Many critical skills and aptitudes possessed by safe and effective pilots are known and can be measured with special tests which have been constructed specifically for this purpose. When these tests are administered to applicants for the job of airline pilot we do get accurate measures of their ability with respect to a number of critical requirements.

An effective selection procedure requires a continual follow-up study of those selected. Only rarely is a systematic follow-up study undertaken. Such a study provides an accurate check on the selection procedure and furnishes data for making constant refinements in the procedure. When these data accumulate into large numbers, new pilot-requirements are likely to be discovered and will be added to the present list of requirements, and new tests will be developed to measure these.

On the following page are listed the critical requirements of the airline pilot's job as determined by several research studies in the field of piloting. Pilot selection procedures have been developed from these critical requirements by the American Institute for Research.

Critical Requirements

of the AIRLINE PILOT'S JOB

1. JUDGMENT AND PLANNING: The ability to reason logically, to anticipate, and to use good judgment in practical situations.
2. PILOT INFORMATION: The possession of adequate knowledge of aero-equipment, principles of flight, instrument flying, navigation, and weather.
3. MECHANICAL RELATIONS: The ability to visualize mechanical movements and to have insight into the operating principles of mechanical devices.
4. VISUALIZATION OF MOVEMENT: The ability to visualize movements in the attitude of an object and to visualize the flight path of an airplane through space.
5. INSTRUMENT READING: The ability to obtain data from instrument dials and scales quickly and accurately.
6. INSTRUMENT INTERPRETATION: The ability to determine the attitude of an airplane from interpretation of the readings of instruments.
7. SIGNAL REACTION TIME: The ability to perceive a situation, decide quickly on the appropriate response, and make the correct movement.
8. COORDINATION: The ability to make smooth and precise movements.
9. ORIENTATION: The ability to recognize landmarks from maps or photographs and to orient with reference to fixed positions in space.
10. PERSONAL STABILITY: The ability to remain organized and to make appropriate responses in adverse or unusual situations.
11. ATTITUDES AND INTERESTS: The possession of personal attitudes and interests appropriate for an effective airline pilot.

A Selection Service

A selection service based on the most complete research done in the field of piloting is being made available as a current service to airline companies. In addition to its value as a service, it will also provide a basis for constant follow-up to improve pilot effectiveness through further development of the critical requirements of the airline pilot's job.

Tests constructed specifically for measuring the critical skills and aptitudes possessed by safe and effective pilots have been developed by the American Institute for Research, and will be administered to pilot-applicants. For each applicant whose skills and aptitudes are evaluated, an individual evaluation profile will be prepared which will provide the company with a record of the applicant's performance on the tests. The company will then have unbiased objective information upon which to base its selection.

For the airline company this means a reduction in the cost of training, in the loss of equipment and lives; and in the long run pilot effectiveness should be substantially increased by obtaining the best men at the time of selection.



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